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## Cost effective biosecurity for NICPS operations in Indonesia

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## 2 Executive summary

The project addressed issues of importance to the Indonesian poultry industry following the entry of HPAI into the country in 2003. Significant work was being undertaken with regard to village chicken systems but disease movement and poultry mortality issues within the non-industrial commercial poultry sector (NICPS) were not being examined. It was clear that the structure of the value chain was not encouraging farmers to improve their biosecurity with resultant continuation of human and chicken mortalities throughout Indonesia.

The aim of the project was to use a value chain approach to reduce the risk of disease in NICPS farms through providing economic incentives for smallholders to invest in biosecurity. The project was managed by UNE in partnership with DGL&AHS, FMPI and IPB. Success required value chain development and ownership of project activities by both government (national, provincial and *kabupaten*) and the poultry industry. This project was the first to have an industry association (FMPI) as a formal project partner. Through the provincial industry partners, the project developed value chain stakeholder training and management programs which resulted in a total of 613 stakeholders including 317 smallholders being trained to better understand disease movement and how to reduce disease risk in and around the farm. These smallholders then had the opportunity to be part of a farm approval process which would allow them to participate in a trial which developed and implemented a 'clean market chain' and rewarded smallholders, through the receipt of a premium price, for their investment in biosecurity.

To develop this chain required stakeholders at all levels to work together to develop processes and protocols to approve farms, ensure hygiene and segregation during transporting and processing, and supply logoed products in supermarkets. The first step was the development of national (Biosecurity Consultative Group) and provincial (Provincial Steering Committees) institutions which brought together researchers, government and industry to facilitate and give credibility to the process. The second step was to survey consumers and find out if they would be prepared to pay more for products produced on approved biosecure farms. The third step was to understand what sort of farmers would be likely to participate, select and train the farmers and encourage these farmers to implement an agreed biosecurity farm plan which would lead to farms being audited and approved to sell 'Healthy Farm' poultry products.

The production and marketing of 'Healthy Farm' products was trialled in 3 provinces, West Java, Bali and South Sulawesi. In Bali RPAs are receiving an extra 12% from the supermarket to supply the new product and consumers are paying a premium of 38% over regular chicken. 'Healthy Farm' chickens make up approximately 10% of the total sold at the Carrefour supermarket. In South Sulawesi approximately 120 cartons of 'Healthy Farm' eggs are being sold each month with a price premium of up to 56%.

A significant issue in the trial was the lack of scale and the role that contract type plays in encouraging on-farm investment. Further research was undertaken to compare a range of contract types and identify the characteristics of a contract, suitable to both companies and farmers, that would encourage biosecurity improvement. Farm productivity benefits were also evaluated with the results indicating that adoption of approved biosecurity was related to better depletion rates, improved FCR and a higher performance index (IP).

The project has concluded with 'Healthy Farm' products selling in supermarkets in South Sulawesi and Bali and contract companies employing project staff to train farmers, improve biosecurity and produce a product able to attract a premium price. There are also 9 Master Trainers with the skills required to run a range of training activities, a process implemented to measure and improve on-farm biosecurity and a range of SOPs and minimum standards to assist government and industry to continue the development of the Indonesian poultry industry and control poultry diseases.

### 3 Background

HPAI first entered Indonesia in 2003 and is now endemic in 32 of its 33 provinces. It has the potential to cause significant economic loss for the producer (by reduction in income and protein), consumer (by higher prices) and service provider (by decreased demand). It has broader provincial and national level effects caused by increasing trade restrictions and demand for aid. There is also the continuing risk of a global pandemic (240 million Indonesians live closely with, and have close social and cultural ties with, birds), and the risk of HPAI entering Australia (by geographic proximity and close trade and tourist links). As at 2012, HPAI has been responsible for the deaths of over 220 people in Indonesia.

In Indonesia, the poultry industry employs over 10 million people and has an annual turnover of US\$30 billion. There is a total of US\$35 billion invested in the industry and 13,000 poultry markets are held daily. The economic loss caused by HPAI has been estimated at \$1 billion and it has been estimated that direct costs in Indonesia could amount to 0.2% of Indonesia's GDP of US\$300 billion. When the project started (2006) official GoI estimates put the number of commercial poultry dying and culled since 2003 as 11 and 7 million, respectively. This equated to direct losses of US\$36 million and didn't take into account losses in village poultry.

Many poultry from Sectors 1 and 2 (intensive and breeding farms) are slaughtered at abattoirs, largely a 'dead-end' in terms of virus propagation. However, if the farmers sell sick and dead birds in traditional markets, they may be a source of significant viral load and a risk to animal and human health. Sectors 3 (smallholder broiler and layer) and 4 (village chickens) are expected to be the main reservoirs and propagators of the HPAI virus as they are for other avian diseases. This project worked with the non-industrial commercial (NICPS) farms which included broiler and layer farms of between 1,000 and 50,000 birds that were producing for the market. It excluded the industrial sector and the village chicken sectors.

Annual numbers of chicken in Indonesia is approximately 1.37 billion (Table 1) with 70% of these being broilers. This is a population increase of 10% since 2001. The largest increases are occurring in the broiler and layer sectors.

**Table 1: Livestock populations ('000)**

	2001	2003	2005	2007	2009	2011
Cattle	11,137	10,504	10,569	11,515	12,760	14,824
Village chickens	268,039	277,357	278,954	272,251	249,964	274,893
Layer	70,254	79,206	84,790	111,489	99,768	105,210
Broiler	865,075	847,744	811,189	891,659	991,281	986,872

Source: BPS, DGL&AHS, 2013

The aim of this project was to improve poultry farm biosecurity through the provision of economic incentives. This was consistent with the National Strategic Work Plan for the Progressive Control of HPAI in Animals 2006-2008. The Project was consistent with two of the nine strategies which focussed around enhancing HPAI control (no.2) and poultry industry restructuring (no.9). The formation of KOMNAS and the CMU within Indonesia was evidence of the priority placed on HPAI control in Indonesia. The importance of biosecurity

and the need for economic research (market chain, industry restructuring) and private-public partnerships was also stressed in the draft ASEAN Regional Strategy for the Progressive Control and Eradication of HPAI (2008-2011).

Within Indonesia, while considerable work was being undertaken in the village chicken sector little work was being done directly in the NICPS. The lack of biosecurity in the NICPS ensured that HPAI could not be effectively controlled. Lack of biosecurity past the farm gate, limited trace-back, multiple production cycles, low level of understanding of biosecurity, and minimal price differentiation between healthy and sick birds led to poor implementation of farm biosecurity systems. The project believed that adoption of appropriate biosecurity measures in the NICPS, if demonstrated to be simple, affordable and effective, would substantially change the productivity and zoonotic threat in the poultry industry.

The poultry industry, KOMNAS, CMU, FAO and other stakeholders<sup>1</sup> in Indonesia showed strong support for this project seeing it as potentially playing a vital role in industry development and restructuring. All recognized the need to minimise the role of the NICPS in HPAI transmission, however, the major concern of poultry grower associations and companies, was the lack of control of poultry products post-farm gate. Without the ability to ensure, or accredit a product as 'HPAI-free' there was a lack of incentive to implement significant biosecurity measures.

The project, therefore, developed and tested value chain interventions that would encourage smallholder poultry producers to improve their biosecurity. This included developing a clean market chain (CMC) whereby products produced on 'approved' farms would have permission to use the 'Healthy farm' logo and sell their products in supermarkets at premium prices.

Current poultry market chains in the NICPS involve the transport of live birds to traditional markets. At present consumers have a preference for purchasing live birds as they are cheaper, and the consumer can be confident they are fresh and healthy. Chilled market chains are not well developed and consumers lack confidence in the product quality. Products from biosecure farms marketed through a clean market chain have the potential to increase consumer awareness of issues and confidence in the product.

Recent advances in the industrial sector in the implementation of biosecurity measures have not been matched in the NICPS. The nature of the market chains required approaches that can address the socio-economic factors that make this sector difficult to regulate. With low to minimal biosecurity systems, the NICP and village chicken sectors are exposed to higher risk of HPAI infections compared with the industrial sector.

A CMC provided a mechanism to reduce the spread of virus by ensuring all links in the chain had measures in place to minimise the risk of virus accumulation, disease outbreak and spread. The CMC required that broilers from farms that had approved biosecurity measures in place would pass through audited slaughterhouses and be sold in supermarkets that are able to charge a premium price for the product. The potential of a premium price, along with other productivity benefits provided by improved biosecurity, would encourage NICPS producers to improve their biosecurity with support from other actors along the chain. A CMC will drive biosecurity implementation throughout the sector as more retail outlets (such as fast food chains) demand these products.

The CMC commenced as a pilot project in three provinces: Bali, South Sulawesi and West Java. In each province, the aim was to develop a niche market for chicken meat and eggs

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<sup>1</sup> Stakeholder groups are the participants in the poultry product marketing chain and include the private sector's lenders, creditors, contractors and service providers and the government's regulators and extension and animal health services.

from biosecure farms by creating economic incentives for all market chain stakeholders including consumers, retailers, processors and smallholders. The long term goal of the CMC was for the premium market chain for the two differentiated products (chicken meat and eggs) to be expanded and developed by the industry stakeholders and local communities themselves (an industry-driven approach), spreading throughout Indonesia. The growth in supermarket share (driven by Indonesia's continuing economic growth) of the poultry market and government determination to increase biosecurity should assist in the longer term. It is essential to emphasise that the aim of the CMC trial was to facilitate the implementation of a CMC through the creation of economic incentives for industry stakeholders, rather than being a 'donor'. The project did not have a sufficient budget to generate a significant market intervention, such as subsidy for the premium products. The aim was the sustainable adoption of cost-effective biosecurity measures within the NICPS, and raising awareness of the control and prevention of animal disease across the entire marketing chain, from farm gate to consumers. Apart from the positive effect of the reduction of disease spread on the poultry industry, the improving biosecurity should also boost farm income by improving productivity and decreasing disease risk.



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## 4 Objectives

**Aim:** To improve the economic viability of commercial broiler and layer producers through the sustainable adoption of cost-effective biosecurity measures.

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### 4.1 Original Phase

#### **Objective 1: Develop an industry-driven and supported approach to improving on-farm biosecurity in the NICPS**

- Activity 1: Develop and implement a project management, delivery and review strategy.
- Activity 2: Establish Biosecurity Consultative Group within the FMPI.
- Activity 3: Establish Poultry Biosecurity Centre to manage and coordinate the development and implementation of training programs and on-farm adoption.
- Activity 4: Establish project support structures in three implementation areas.

This objective was to ensure appropriate management systems were established and the project was aligned to industry and government needs. Advisory groups consisting of government, industry and academic representatives were established at national (Biosecurity Consultative Group) and provincial (Provincial Steering Committees) levels. These groups ensured that information flowed to relevant stakeholders and these stakeholders had input into project activities via close working relationships with the Provincial Project Coordinators. They also became forums for poultry industry discussion.

The Pusat Biosekuriti Unggas Indonesia (PBUI, Poultry Biosecurity Centre of Indonesia) was established with two managers; one responsible for government and industry liaison and the other training and biosecurity management. All project training, farm planning, farm accreditation and auditing process were undertaken under the auspices of the PBUI.

#### **Objective 2: Define the biosecurity measures that will improve the biosecurity and the economic viability of NICPS in Indonesia.**

- Activity 1: Collect baseline economic, social and production data and identify potential cost-effective biosecurity interventions.
- Activity 2: Survey and workshop stakeholders to determine the motivations and mechanisms for increasing biosecurity.
- Activity 3: Identify market chain issues (post farm-gate) that limit the ability of NICPS farmers to adopt biosecurity measures.
- Activity 4: Define cost-effective biosecurity interventions for a range of farming, social and institutional situations.

Research was undertaken to understand what influences farmer adoption of biosecurity. Workshops, conferences, Masters theses and journal articles were produced that detailed the factors affecting adoption and the economics of on-farm biosecurity investment. The project also worked with other poultry value chain stakeholders to understand their activities and the influence they can have on farm management decisions. These stakeholders included contractor companies, slaughterhouses and consumers.

### **Objective 3: Facilitate adoption of cost-effective farm and community biosecurity measures in NICPS.**

- Activity 1: Develop, with the assistance of other stakeholders, appropriate farmer and livestock officer training packages and implement training programs in case-study locations.
- Activity 2: Evaluate and implement institutional and economic incentives to facilitate adoption of biosecurity measures.
- Activity 3: Develop and implement NICPS minimum biosecurity standards and associated farm and advisor accreditation systems.
- Activity 4: Test and evaluate cost-effective biosecurity measures in selected farmer groups.
- Activity 5: Facilitate, with industry ownership and control, adoption of biosecure NICPS farms and poultry marketing chain.

Through the PBUI, appropriate training packages were developed for farmers, advisors, auditors and other industry stakeholders. These were implemented in three provinces (West Java, Bali and South Sulawesi) with a total of over 300 farmers being trained directly by the project and through FAO and USAID using the project resources and trainers.

The project also instigated a supermarket trial to test whether or not consumers would purchase products from 'biosecure' farms (farms which had implemented agreed biosecurity activities). 'Healthy Farm' products approved by the PBUI and provincial governments are still selling in supermarkets in Bali and South Sulawesi. To be able to sell into these markets required farmers, with assistance from the project staff, to produce and implement a farm biosecurity plan which was in turn audited by independent auditors. Prices for these products sell at a premium price in supermarkets. Productivity benefits from improved biosecurity were also evaluated with the level of farmer benefit being influenced by the particular contract company farmers were signed up to.

Processors involved in the project also had to meet both government and project hygiene standards and implement a protocol to keep 'Healthy Farm' chicken separate from regular chickens in the slaughter and transport process.

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## **4.2 Addition of South Sulawesi (AusAID Funding)**

The original plan was to undertake project activities in 3 Indonesian provinces; West Java, Bali and South Sulawesi from June 2009 to May 2012. However, during the initial implementation period it became clear that this would not be appropriate for the following reasons;

- FAO were interested in becoming involved in Sulsel and also identified the importance of biosecurity in minimising the spread of HPAI. There was concern about potential overlap, so a delay in implementation and consultation with this project was recommended.
- It became clear during initial implementation that institutions established to ensure project success would also be useful in coordinating a broader range of government and donor projects and activities aimed at control of HPAI in Indonesia. The institutions set up by the project PSCs, BCG and PBUI were of significant interest to the industry and, if to be effective, required a greater investment of resources.
- There were difficulties obtaining appropriate support from project partners for office space and in-kind support in Sulsel.

- Exchange rate issues early in the project put pressure on the budget during the first year of the project.

By June 2010 significant consultation had taken place, not only between this project and FAO, but also with other donors and government agencies. It was clear that with additional financial assistance (provided by AusAID/FAO of \$300,000) the project would be able to fulfil its objectives as originally planned in Sulsei, and assist the FAO project to meet its shorter-term project goals. While there were complementarities between the projects there were also differences. The ACIAR project was designed over a 4 year timeframe to research, develop and encourage adoption of cost-effective biosecurity measures on NICPS farms. It placed greater emphasis on developing economic incentives to encourage adoption and greater national industry-level participation and ownership of outcomes. The FAO project, while similar, had a focus in 1 province and a greater emphasis on surveillance and monitoring and a 2-year duration.

Planned activities and outputs from June 2010 to May 2012 included:

**Baseline data collection:** A survey of broiler and layer farmers to identify the socio-economic drivers of biosecurity adoption similar to Bali and West Java.

**Training:** Continue the project training program. The FAO project agreed to contract the PBUI to undertake their training program as appropriate.

**Farm and product accreditation:** This was a significant goal of both projects, with focus groups being undertaken in Bali and West Java to define roles and responsibilities in the chain and identify interested partners in developing a clean, safe market chain. Workshops to plan and implement a clean market chain were undertaken, with a CMC chain implemented in June 2011.

**Biosecure farm awards:** Further development of competitions between farmers and communities to encourage adoption of biosecurity measures. This activity was replicated in Bali and West Java.

**Management systems:** The ACIAR project had already formed the Provincial Steering Committee (Sulsei). The role of this group was expanded to coordinate and facilitate all government and donor programs in this area. The role of the PBUI also continued to be expanded in Sulsei.

**Identification of cost-effective biosecurity:** As in the other provinces it was necessary to not just encourage general adoption of biosecurity measures, but within the institutional and social context, develop appropriate levels of biosecurity that would be effective (i.e. reduce the risk of poultry disease loss on farm) and adopted by NICPS farms.

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### 4.3 Funded extension (June 2012 – December 2012)

The project had made considerable progress in developing effective biosecurity in smallholder farming systems in Indonesia. It developed and implemented case studies where products from approved biosecure farms have been sold in supermarkets at a premium price. The project had also had a significant impact at the national level, playing an important role developing biosecurity training programs, farm accreditation systems and developing an institutional framework for the sustainable maintenance of these activities. To consolidate the results of the project the following activities were required:

- Defining appropriate contracts that encourage biosecurity

The contractor companies have a major influence over the adoption of biosecurity in NICPS broiler farms in Indonesia. Although these contracts include biosecurity requirements in many cases the benefits of improving biosecurity do not accrue to those who invest i.e. the smallholder farmers. An Indonesian Masters student studying at UNE (Putri Komaladara – UNUD, Bali) identified which contracts best encourage farmer adoption.

- Monitoring productivity benefits due to biosecurity improvements

There are assumed on-farm benefits of increased productivity, decreased mortality and improved feed efficiency from improving biosecurity. Using the industry contacts in Bali, the project attempted to get access to farm production data from the contract companies. The research evaluated whether or not there was evidence of productivity increases on farms that have adopted project monitored farm plans.

- Video production

There has been some video produced to provide a summary of project activities. There was a need to do these in more depth and with better understanding of the respective target audience. Videos were required by:

- ACIAR: to summarise the project and show the results a required forums and to appropriate other stakeholders
- Supermarkets: in order to better inform consumers about the nature of the 'Healthy Farm' product and where it originates
- Pk Suparwo: A strong project supporter and adopter of biosecurity recommendations, Pk Suparwo had been recognised nationally for his production and marketing layer operation. Required a video highlighting biosecurity on his farm
- Others as required.
- Evaluation of CMC in 3 provinces and recommendations for all stakeholders about future product placement

A major component of the project was the case studies where products from approved biosecure farms were sold in supermarkets for a premium price. An independent review (including Australian and Indonesian researchers) was undertaken to assess the reasons for the variations in success and evaluate how the characteristic of 'product from a biosecure farm' could be added to other product characteristics to better improve uptake.

- Journal, magazine, newspaper articles

There is a now a wealth of research data available for publication in both journals and industry magazines. The Indonesian poultry industry was very keen to access this information. The publication of information in magazines such as Trobos, Poultry Indonesia, Infonet, and Agrina cost from \$100 to \$1,000 per page depending on placement and quality.

- Integration of PBUI into Indonesian poultry industry

A significant aim of the project was to work with the industry and facilitate the development of sustainable training and farm accreditation systems. There was still the aim of integrating the PBUI into the mainstream of the poultry industry as an institution with responsibility for farm accreditation and training. It was an opportune time to be involved in this as the government and industry made up of the associations (GAPPI, GPMT, GPPU, GOPAN, ASOHI, ARPHUIN, ASOHI, PINSAR) had instituted a new structure for the association umbrella organisation the FMPI (still under the Directorship of ACIAR project partner – Don Utoyo) The project assisted in the development of this as well as participating in the continued development of smallholder farm accreditation systems and the design and implementation of a poultry industry levy.

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#### **4.4 No-Cost extension (January 2013 – May 2013)**

Extra time was required to produce the videos and undertake the review/summary of the 'Healthy Farm' trial. Dr Geoff Smith and Dr Hasnah were contracted to undertake the review and it was completed in May 2013.

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## 5 Methodology

The Project was managed by the University of New England in partnership with the Directorate General Livestock and Animal Health Services (DGL&AHS), Bogor Agricultural University (IPB), Udayana University (UNUD) and the Indonesian Poultry Industry Forum (FMPI). Through the DGL&AHS, the Project also worked closely with Provincial Departments of Agriculture (Dinas Pertanian) in the provinces of West Java, Bali and South Sulawesi. Through the FMPI the project was also able to work closely with the poultry farmer associations in Bali (Paguyuban Peternak Ayam Se Bali), West Java (Gabungan Organisasi Peternak Ayam Nasional) and South Sulawesi (Forum Komunikasi Masyarakat Perunggasan). Representatives from these organisations acted as Heads of the PSC in each provinces and developed strong working relationships with the PPCs. The Project also worked closely with Hasanuddin University (South Sulawesi) and ICASEPS for specific research and implementation activities. As there were many donors working in the area of HPAI in Indonesia, Project staff worked closely with FAO, IDP, USAID to both coordinate programs and implement training and extension programs.

The methodology used to improve the adoption of biosecurity activities in the NICPS revolved around three principles, these were:

1. *A whole of industry approach* including government, the service sector and farmers. As there are significant public benefits (e.g. food security, lower risk of pandemic), the government does have a significant role in HPAI control (e.g. policy and regulation, input subsidies, training and awareness). However, if HPAI is to be successfully and sustainably managed, there needs to be significant input from the private sector. Input suppliers, contractors etc need to encourage farmers to improve biosecurity. There needs to be an economic imperative for the private sector and the farmers to invest in biosecurity. This project placed a special and unique emphasis on integrating the project into the private sector. Successful adoption of least-cost biosecurity measures in the NICPS depended on the support and input of the entire poultry industry.

In Years 1 and 2 there was a focus on; establishing the BCG and PSCs so that all stakeholders could consult and coordinate with the project; establishing project management systems that ensure ownership by the poultry sector; identifying communities to be directly involved with project activities; identifying the institutional issues that limit a farmer's ability or desire to adopt biosecurity measures. This involved developing partnerships with existing research providers (e.g. ICASEPS, UNUD, FAO) who were working in the areas of market-chain and government policy analysis. Years 3 and 4; used the institutions and industry linkages developed to assist the adoption of biosecurity measures in the three project communities; facilitated the development of the PBUI; continued to work with the whole industry to assist policy development, particularly in the area of post farm-gate marketing; used the lessons learned from community adoption to facilitate the introduction of biosecurity agribusiness models for use by other communities.

This approach ensured that activities and outputs of the project were consistent with the objectives of the poultry industry and stakeholders had ownership.

2. *A community approach* was used to implement project outcomes in the three case-study areas. The project did not just provide policy advice and recommendations but learnt about adoption success and failure through community trialling and monitoring.

Biosecurity is dependent upon effective on-farm surveillance. The most important people for identifying and notifying a disease outbreak are the farmers and others who work with chickens. It is the local community that needs to instigate appropriate bio-security arrangements to contain the spread of the disease.

Project activities were located in Bali, West Java and South Sulawesi. Specific farmer groups were the primary sources of household data used to identify least-cost biosecurity options. Activities in Years 1 and 2 in the three case study areas were based around; defining practical least-cost biosecurity measures; training PPCs and developing farmer and advisor training programs.

Years 3 and 4 involved training other public and privately employed livestock staff and implementing biosecurity systems in the three selected case-study communities. Farmers participating in the farm approval process were given specific training and support to assist them improve their biosecurity.

3. A *whole market-chain approach* ensured that the adoption of cost-effective biosecurity measures was appropriate given the cultural and institutional characteristics of the poultry market. The project worked with all stakeholders in the industry to define and implement improvements to particular institutional constraints such as post farm-gate marketing systems. Particular attention was paid to engaging the post farm-gate stakeholders (e.g. processors) in order to improve post farm-gate institutional support. Project outputs are functioning biosecurity systems in three communities receiving economic benefits such as improved productivity, improved prices for their products and a reduction in risk.

## 6 Achievements against activities and outputs/milestones

### Objective 1: Develop an industry-driven and supported approach to improving on-farm biosecurity in the NICPS

Activity	Outputs/milestones	Completion Date	Comments
1.1 Develop and implement a project management, delivery and review strategy.	Stakeholder workshops completed.	Oct 2008	The opening workshop invited 60 people over 2 days, recruiting industry stakeholder support and recognition of the importance of biosecurity. Participants included all donor agencies, poultry industry associations and government agencies Quarterly workplans produced by PPCs
	Project management and communication protocols developed.	Aug 2008	The project website has been maintained at <a href="http://www.une.edu.au/research/research-centres-and-institutes/institute-for-rural-futures/international-development-research/?a=14763">http://www.une.edu.au/research/research-centres-and-institutes/institute-for-rural-futures/international-development-research/?a=14763</a> All project reports (monthly, annual and misco) are available on this website PPCs prepare 6-monthly work plans.
1.2 Establish the Biosecurity Consultative Group (BCG).	BCG minutes of meetings.	Jun 2008	The BCG formed and met quarterly during the life of the project
	Group operating effectively	Nov 2011	BCG members undertook study tour to Canberra, Sydney and Armidale
1.3 Establish the Poultry Biosecurity Centre	Management protocols established.	Aug 2008	PBUI established
	Manager and staff appointed at IPB.	Aug 2008	Co-Managers were appointed: Drh. Didin Sudiana (Industry Liaison) and Dr Dewa Dharma (Training). Name changed to <i>Pusat Biosekuriti Unggas Indonesia</i> (PBUI). PBUI is a recognised training institution in Indonesia.
	Trainers qualified	Apr 2012	There are 9 Indonesian Master Trainers including 5 project team members. Other 4 are from industry and government

Activity	Outputs/milestones	Completion Date	Comments
1.4 Establish project support structures in three implementation areas.	Established project offices	Feb 2010	Offices established at UNUD (PPC Bali), IPB (PPC Jabar), Dinas Peternakan office and SADI office (PPCs, Sulsel)
	Appointed PPCs	Feb 2010	PPCs appointed Jabar: Drh. Bugie Kurnianto (Training), Drh. Hernomo (Industry Liaison) Bali: Ir Ni Putu Sarini. Sulsel Drh. Amir Hamid (Industry Liaison), Ir. Hasmida Karim (PPC, Training and Management).
	Established PSCs	Feb 2010	PSC's established Bali: Suryawan (Suryawan) Jabar: Bambang Agus (Chairman) Sulsel: Wahyu (Chairman). The PSCs were renamed Clean Market Chain Working Groups to reflect the focus on market chain development in 2011.

**Objective 2: Define the biosecurity measures that will improve the biosecurity and the economic viability of NICPS in Indonesia.**

Activity	Outputs/milestones	Completion date	Comments
2.1 Collect baseline economic, social and production data.	PPC study tour completed.	Aug 2011	Dr Tristan Jubb completed study tour in Jabar with PPCs.
	PPCs proficient in farm auditing and biosecurity	Dec 2011	PPCs completed advisor training in Jabar, fully trained as Master Trainers and Auditors
	Baseline farmer survey planned	Feb 2009	Surveys trialled, planned
	Longitudinal baseline data collected	May 2010	Survey in Jabar and Bali completed. 228 farmers were interviewed 3 times, 4 months apart, 127 broiler smallholders and 101 layer smallholders. Survey in Sulsel completed with assistance from FAO and UNHAS, 120 farmers
2.2 Qualitative risk assessment	QRA planned	Aug 2008	Dr Jenny-Ann Toribio with student support (Debbie Eagles) completed a risk analysis in Bali and Sulsel. Master dissertation and report completed
	Data collected, risks prioritised,	Feb 2009	
	Report written	May 2010	



Activity	Outputs/milestones	Completion date	Comments
2.3 Survey and workshop stakeholders to determine the motivations and mechanisms for increasing biosecurity	Focus groups Key stakeholder interviews held Report written. Key motivators understood.	Aug 2009	The focus groups in Bali and Jabar completed. Reports completed. Article written in SOCA. Issues identified to be considered when developing a 'clean market chain'
2.4 Identify market chain issues (post farm-gate)	Focus groups Key stakeholder interviews held Report written. Issues identified and measures to address the issues developed.	Aug 2009	The focus groups in Bali and Jabar completed. Reports completed
2.5 Research key technical issues	Research reports	Jun 2010 Jun 2010 Nov 2011 Jun 2013 Apr 2013	Consumer surveys completed in Bali (UNUD) and West Java (ICASEPS). Initial results being presented in workshop (see website) Drh Bugie Kurnianto completed a Masters program with dissertation Drh Hasmdia Karim undertaking Masters Program with dissertation. Putri Komaladara completed a MEc at UNE Ir Sarini Pande completed study into on farm productivity benefits of biosecurity
2.6 Define cost-effective biosecurity interventions for a range of farming, social and institutional situations.	Workshop Project report  Cost effective solutions identified	Jun 2010 Sep 2012  Oct 2013	National workshop held 63 farm plans implemented, data identified cost-effective biosecurity And appropriate contracts to encourage NICPS biosecurity adoption ACIAR Technical Report drafted and submitted for which approval and funding has been granted.

**Objective 3: Facilitate adoption of cost-effective farm and community biosecurity measures in NICPS.**

Activity	Outputs/milestones	Completion date	Comments
3.1 Develop and implement farmer and livestock officer training packages in case-study locations.	<p>Training packages/ programs developed</p> <p>Training delivered. Extension packages developed and delivered (30 workshops, 180 advisors, 90 auditors, 180 other stakeholders)</p>	<p>Jan 2009</p> <p>May 2012</p> <p>May 2013</p>	<p>A 5-day training program produced by Drs Tristan Jubb and Dewa Dharma. This was first delivered to advisors in Bogor in Feb 2009.</p> <p>An abattoir auditing protocol for assessing biosecurity and hygiene in poultry abattoirs was developed</p> <p><i>Advisor:</i> Bali; 3 courses (45 participants) Jabar; 3 (61) Sulsel: 2 (41)</p> <p><i>Farmer:</i> Bali; 8 (138) Jabar; 4 (67) Sulsel: 4 (72)</p> <p><i>Auditor:</i> Bali; 1 (16) Jabar; 1 (11) Sulsel: 1 (13)</p> <p><i>Train the Trainer:</i> Bali; 1 (15) Jabar; 1 (15) Sulsel: 2 (34)</p> <p><i>Stakeholder:</i> Bali; 1 (15) Jabar; 1 (18) Sulsel: 1 (22)</p> <p>A total of 35 training activities including 583 participants</p>
3.2 Evaluate institutional and economic incentives to facilitate adoption of biosecurity measures.	<p>Workshop</p> <p>Project report</p> <p>Gol and industry policy changes</p>	<p>May 2013</p>	<p>A team of pricing consultants engaged and report received. Consumer willingness to pay surveys completed in the 3 project locations.</p> <p>Subsidies paid by project to farmers as a one off for product launch in June 2011.</p> <p>ACIAR Technical Report will summarise this work</p>

Activity	Outputs/milestones	Completion date	Comments
3.3 Develop NICPS minimum biosecurity standards and associated farm and advisor accreditation systems	Workshop Project report Gol and industry policy changes	December 2011	Minimum biosecurity standards are established at project level but not yet adopted by DGL&AHS. A Ministerial decree and regulations are required before farms can be certified. An accreditation system for farms, advisors and auditors was developed to service the clean market chain. This system continues in South Sulawesi and Bali. Official integration of these into the Indonesian poultry industry is beyond the scope of this project,
3.4 Test and evaluate cost-effective biosecurity measures in selected farmer groups.	Project reports Adoption evaluation report. Intervention proof of concept	Dec 2012	2 studies finalised the testing and evaluating of cost-effective biosecurity. Biosecurity farm plans on 90 farms implemented and audited
3.5 Facilitate, with industry ownership and control, adoption of a biosecure NICPS farms and poultry marketing chain	Project reports Adoption evaluation report Final workshop Final report (600 poultry farms)	June 2011          October 2013	Clean market chain working groups formed (superseding PSCs) in Bali, Jabar and Sulsel. Appropriate stakeholders identified. Initial workshops in Bali and Jabar completed. Workshop reports completed. Factors contributing to success and failure of the CMCs will be described in the ACIAR Technical Report

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## 7 Key results and discussion

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### 7.1 Project and industry leadership

#### 7.1.1 Biosecurity Consultative Group (BCG)

As the smallholders were contract farmers it was necessary to ensure that the CMC concept was agreed to and supported by the industry at the national level. To this end the project established the Biosecurity Consultative Group (BCG) which was used to both inform the industry of the CMC activities and provide a forum whereby biosecurity issues and the nature of contracts could be discussed. The BCG functioned as a subcommittee under the FMPI with broad responsibility for the development of industry-wide policy and adoption of biosecurity interventions in the poultry industry. Members of the BCG were representatives of government, contract companies (Charoen Pokphand and Japfa Comfeed), farmer associations (Pinsar and GOPAN), universities (IPB) and the ACIAR project. Members of the BCG were; Don Utoyo (FMPI), Hartono (Pinsar), Didin Sudiana (DGLS), Arief Daryanto (IPB), Tri Hadiyanto (GOPAN), Desianto Utomo (CP) and Ian Patrick (UNE, ACIAR). The aims of the BCG are provided in Appendix 1.

#### 7.1.2 Indonesian Poultry Biosecurity Centre (PBUI)

The PBUI was established in 2008. It was funded by the project and was the institution through which all project and CMC activities were implemented. It had no legal status or financial support from government or industry partners. Its aims were twofold:

1. Facilitate project biosecurity training activities, and
2. Become established as an independent biosecurity auditor for small scale poultry farms and poultry slaughterhouses.

Through the PBUI the project developed training programs for all stakeholders within poultry market chains. It also trained master trainers to ensure sustainability of the system. The PBUI also took responsibility for developing and implementing the farm biosecurity plans required for farmers and RPA auditing, these were necessary components of developing the CMCs.

The project employed drh Didin Sudiana (based in the DGL&AHS office in Jakarta) as the PBUI Manager (Industry Liaison and Management) and Dr Dewa Dharma (based in Bali) as the PBUI Manager (Training and Policy Development). The statement of duties for these roles is presented in Appendix 2.

#### 7.1.3 Provincial Project Coordinators (PPC)

As the aims of the project involved working jointly with industry and government it was important to ensure there was a level of independence between project staff and particular industry and project partners. A PPC was recruited for each province. In Bali Ir. Ni Putu Sarini was employed, she was a lecturer at UNUD but had sufficient time available to manage project activities. She was provided with an office at UNUD. In West Java, drh Bugie Kurnianto Prasetyo was a new graduate and hence employed as a project staff member with an office at IPB. Having offices at universities was seen as a visible means of independence from particular groups. It was a bit more difficult in South Sulawesi with a lack of access to an independent office at the beginning of the project. When the South Sulawesi extension was approved Ir. Hasmida Karim was able to get an office at the ACIAR office in Makassar. She was responsible for training and project management. drh Amir Hamid (a retired head of the provincial Dinas) was employed to assist with industry and government liaison. The statement of duties for the PPCs is provided in Appendix 3.

### 7.1.4 Project Steering Committees (PSC)

PSCs were established to provide a forum for discussion concerning project activities in the provinces. They also provided advice and assisted the PPCs access appropriate resources and networks. The PSC changed its name to a Clean Market Chain Working Group when the CMC trials began in each province. The membership was expanded to include all stakeholders in the value chain (including supermarket representatives) and given the direct role of facilitating the production and marketing of the 'Healthy Farm' products. These Working Groups provided access to farmer groups and other provincial stakeholders, advised on processes required to develop stakeholder relationships and assisted in ensuring sustainability of CMC outcomes. Their structure was similar to that of the BCG comprising provincial government, industry (including contract companies, supermarket and RPA), farmer and university representatives.

The PSC/CMCWG in each province consisted of:

Bali: Suryawan Dwimulyanto (Head of PSC/GOPAN), Ni Putu Sarini (PPC-Bali), IGA. Putri Jayaningsih (Secretary/Livestock Services), I Nyoman Suparta (Farmer), Didik Wahyudianto (Charoen Phokphan), Yunindra (Japfa), Wayan Seputra (ASOHI).

West Java: Bambang Agus (Head of PSC/GOPAN), Bugie Kurnianto Prasetyo (PPC-Jabar), Titiek Legiwati (Dinas Peternakan Propinsi), Soetrisno (Dinas Peternakan Kab Bogor), Mintasih (PINSAR), Herlien Krisnaningsih (Dinas Peternakan Kota Bogor), Sri Murtini (FKH IPB).

South Sulawesi: Wahyu Suhadji (Head PSC/FKMP), Midah Karim (PPC-SulSel), Suparwo (Layer farmer), Suhartono (Japfa Comfeed), Ali Imron (CP), Nurlina Saking (Dinas Peternakan Propinsi), Ramli (Farmer).

The aims of the original PSC are presented in Appendix 4 and a sample of a meeting invitation and agenda in Appendix 5.

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## 7.2 The PBUI biosecurity training program

### 7.2.1 Background and summary

In order to develop a market chain where the consumers could be confident that the product they were purchasing had the characteristics they required, it was necessary to develop a farm approval process that provided other value chain participants (transporters, RPA, supermarket and consumers) with assurance that the farms providing the 'Healthy Farm' products met the required standard. The first step in doing this was to provide farmers with biosecurity training and develop a system where trained advisors and auditors could independently assess and approve a farm with regard to its level and adoption of biosecurity. The aims of the training program were:

1. To develop a generic training program that could be implemented by PBUI Master Trainers that provide an appropriate understanding of biosecurity to all participants in the poultry value chain.
2. To train sufficient farmers, advisors and auditors to assist the development and implementation of the CMC in the 3 case study provinces in Indonesia.

Training packages were prepared by PBUI staff. There were 5 specific training activities developed and implemented (Table 2). These were designed as highly interactive sessions that encouraged maximum participation and involvement of all participants. Outlines to 3 of the training programs are provided in Appendix 6. They summarise the training methods, outcomes and assessment procedures. A brochure introducing the training program and distributed to partners was also produced, this was to encourage other agencies and donors to use the PBUI/project training resources and expertise (Appendix 7).

**Table 2: Types of training developed and implemented by PBUI**

Name of training	Days	No. of Participants	Participants
Advisor	4 – 5	20	Veterinarian, animal production, farmers
Farmers	2	20	Broiler and layer farmers
Auditor	2	15	ACIAR certified advisor
Train the trainer	1	15	ACIAR certified advisor
Stakeholder	1	15	Industry, government, association poultry shop, drug companies, feed companies, outlet, bank, consumers

The maximum number of expected participants for the advisor and farmer training was 20 and for auditor, stakeholder and ToT training it was 15. These limitations were to ensure maximum involvement in the training activities. The participants were divided into groups of four to five, each group discussed questions and solved problems put by the Master Trainer and then presented answers to the class. These were participative, interactive problem solving sessions. At the end of the workshop participants took home the reference manual and the work book for future reference. The work book was used as an indicator of how much participants had learned during the training and allowed the facilitator to make corrections or suggestions so that they have correct understanding about biosecurity and a record of what was done.

During the project a total of 613 value chain stakeholders have participated directly in PBUI training activities (Table 3), this included 317 farmers and 137 farm advisors from both public and private institutions. The trainings are discussed in more detail in the following sections.

**Table 3: Number of participants in ACIAR poultry biosecurity training from 2009 to 2013**

Provinces	Advisor	Farmers	Auditor	ToT	Stakeholder
Bali	35	178	16	15	15
Java Barat	61	67	11	15	18
Sulawesi Selatan	41	72	13	34	22
Total	137	317	40	64	55

### 7.2.2 Advisor training

The basis for all training was the 4 to 5 day 'Advisor Training Workshop'. All the other training workshops used selected modules, as relevant, from this advisor workshop (Appendix 8). Participants include veterinarian and animal production staff working with industry or government. The advisor training included a half day farm visit to give the participants experience in identification of farm risk as the basis for farm assessments and biosecurity farm planning. After training the advisors were able to; identify farm risk factors, make comprehensive risk assessments and; be able to make a risk based, cost-effective farm plan applicable to individual farm circumstances.

The project, through the PBUI, implemented a total of 7 advisor training workshops from 2008 and 2013, 2 were supported by FAO and one by USAID. There have been 2 in Bali, 3 in West Java and 2 in South Sulawesi. A total of 137 farm advisors have participated in PBUI advisor raining workshops.

### 7.2.3 Farmer training

There have been 16 farmer workshops conducted by the project between 2008 and 2013. These training workshops were facilitated by the PPCs and an extra PBUI trained advisor in each the province, they were supervised by the PBUI Master Trainer. Training was held in venues appropriate to the location of the participants. A total of 317 farmers have received training and have adopted certain levels of improved biosecurity. Not all continued on to be 'approved' providers of 'Healthy Farm' products. The training package for farmers was a simplified version of the advisor program, especially the work book, schedules and tests. Farmer training took 2 days and participants included both broiler and layer farmers. After training the farmers are expected to have a thorough understanding of poultry biosecurity and a willingness to change the way they conduct risk control on their farms.

### 7.2.4 Auditor training

Auditor training was carried out at the end of 2010 to supply certified auditors to support the 'Healthy Farm' value chain. Auditor training was conducted over 2 days involving a half day farm visit. By the end of the project 40 auditors had been certified. Auditor training has been carried out in Bali, West Java and South Sulawesi facilitated by the PPC's in each province and the PBUI Training Manager. The workshop could only be attended by certified advisors who have successfully completed the advisor training. After completing the course participants will be able to carry out a poultry farm biosecurity audit and recommend corrective action requests (CAR) as required.

### 7.2.5 Stakeholder workshop

One stakeholder workshop was conducted in each province with a total of 55 participants. These workshops were aimed at higher level staff on both government and private institutions all together. The workshop was attended in Bali, West Java and South Sulawesi by 15, 18 and 22 participants consecutively. The workshop was a one day workshop and attended by higher decision makers from industry, poultry association and government officials. Training packages used for stakeholder training covered the same material as the package used for advisors except that the schedule was condensed into one day. This training was designed to make them better understand about poultry biosecurity principles and become better decision makers regarding biosecurity risk control.

### 7.2.6 Training of Trainers (ToT)

ToT was conducted in all project participating provinces, once in Bali, once in West Java and twice in South Sulawesi (one funded by FAO and one by ACIAR). There were a total of 64 participants (15 in Bali, 15 in West Java and 34 in South Sulawesi). Completion of the ToT was a necessary condition of Master Trainer accreditation. The workshop aims and agenda are presented in Bahasa Indonesia in Appendix 9.

### 7.2.7 Master trainers

At the beginning of the project there were only two Master trainers and hence, the early training activities allowed the PPCs to develop their skills and meet the requirements for accreditation as PBUI Master Trainers. Later trainings within the provinces were run by the PPCs with assistance from PBUI trained advisors who were also moving towards Master Trainer status. By the conclusion of the project there were nine Master Trainers, five in Bali, three in South Sulawesi and one in West Java. To become a PBUI-certified Master Trainer required a six step process:

1. Develop two farm biosecurity plans, one with a broiler farm and the other with a layer farm.
2. Plan, prepare and participate in two biosecurity advisor workshops,

3. Plan, prepare and deliver a farmer and stakeholder workshop under supervision of Master Trainer
4. Develop two farm biosecurity plans, one with a broiler farm and the other with a layer farm.
5. Plan, prepare and participate in two biosecurity advisor workshops,
6. Plan, prepare and deliver a farmer and stakeholder workshop under supervision of Master Trainer

### 7.2.8 Lessons learned from the training program

Many lessons have been learned from PBUI training program.

- 1 Training program is an essential and an integral part of a newly developed poultry biosecurity accreditation system which is actually a healthy chicken market chain.
- 2 Establishing a new management system and encouraging farmer investment and changing the behaviour of all stakeholders involved in the system is not easy and took a lot of time and passion.
- 3 This project is a small research project intended to develop a new model/system which can be adopted to different scales within the poultry industry and replicated to other areas nationally. This model is expected to act like a virus which will infect and spread to the poultry industry in other areas outside project participating provinces.
- 4 To support the newly developed system the training program must involve all stakeholders including farmers, contractors, technical services, banks, feed and drug companies, government (local and central), poultry association, poultry shop, consumers etc.
- 5 Different stakeholders need different biosecurity training packages and the difference is mainly in the depth, focus and time allocation (from one to five days). A field visit is necessary for advisors and auditors and perhaps also for farmers. In this ACIAR project there was no field visit during farmer training due to time constraints.
- 6 Even though the workshop training is free of charge during the commencement of the project it was recognized that gathering 15 to 20 people from different stakeholders is not an easy task, especially for the PPC's.
- 7 Many trainees (veterinarians, animal production people and farmers) had previously attended other biosecurity training carried out by other institutions. However, all of them seemed to enjoy the training and had rewarding discussions. Almost all of them attended the course until the closing sessions and were rewarded with certificates.

The training program was useful in a number of ways, the program;

- taught farmers about biosecurity and simple steps required to improve their productivity,
- provided a resource base for Master Trainers to run training programs for other donors and government agencies. The resources have been used by FAO, USDA, provincial Dinas Peternakan (via Dr Dewa Dharma) and the Indonesian Poultry Veterinarians Association (via Bugie Kurnianto), Ciomas Bali (via Ni Putu Sarini)
- provided an opportunity to develop training and workshop management skills within the project staff and Dinas staff,
- identified smallholders keen to be involved in further project activities, and
- assisted extension of biosecurity knowledge among farmers as neighbours learnt from project-trained farmers



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## 7.3 Comparing on-farm adoption of biosecurity

### 7.3.1 The areas of on-farm risk

A necessary step in improving biosecurity is being able to measure present levels of biosecurity. In order to provide advice on what smallholders need to do it is first necessary to be able to evaluate each farm's level of biosecurity. Using the household survey data generated by the project a method of measuring on-farm biosecurity was explored. Each farm was allocated a Biosecurity Control Score (BCS) which took into account each farms' response to the specific risks faced within the seven stages listed below. It is within these stages that farmer's can implement particular activities that reduce the possibility of pathogens entering a farm and shed.

*Stage 1. Vector/fomite status of farm inputs.* Sources of pathogens may be other farms, markets, villages, feed manufacturers or homes where farm staff have pet birds. Some will be high-risk sources, and others low, depending on the microbiological load of the vectors and fomites they generate.

*Stage 2. Traffic onto farm.* Pathogens enter farms via people, animals or things (items that have come into contact with contaminated sources). Higher volumes of people, animals and things (organic things like feed, water and manure, and inorganic things like vehicles and farm equipment) entering the farm carries a higher risk of dangerous levels of pathogens entering the farm.

*Stage 3. Biosecurity at farm boundary.* Physical and functional barriers at the farm boundary are bio-exclusion measures. Physical barriers include fences, gates, wash down bays, and so on. Functional barriers include policies or behaviours preventing entry of people, animals and things considered higher risk, or that lower the risk associated with entry, such as changing clothes or using footbaths.

*Stage 4. Biosecurity between farm boundary and shed.* Scavenging birds, rodents, pets, flies, dust, aerosols, and uncontrolled movement of visitors are the sorts of biosecurity hazards that are present inside the farm boundary that may bring potential pathogens closer to the poultry in the sheds. Farms that control these hazards have a biosecurity advantage.

*Stage 5. Biosecurity at the shed door.* Restricting access of higher risk people, animals and things to sheds, or implementing measures to lower their risk, reduces the likelihood of dangerous levels of pathogens entering the poultry shed and infecting the chickens. Signs, locks, footbaths and bird proof netting are examples of some *shed door* biosecurity measures.

*Stage 6. Traffic into the shed.* Pathogens can enter the poultry shed via people and the animals and things they carry. Introducing systems to reduce the amount of such traffic into sheds offers a biosecurity advantage.

*Stage 7. Susceptibility of the layer and broiler flock.* Disease will only establish in a flock if their resistance to disease is sufficiently low, or their exposure to pathogens is sufficiently high, or both. Resistance to disease is supported by proper vaccination, adequate nutrition, shelter and stocking rates. Exposure to pathogens is limited by taking precautions in the preceding stages 1 to 8, but also by implementing age segregation, all-in-all-out systems, and by compartmenting the flock in a number of sheds.

### 7.3.2 Constructing the biosecurity control score

The BCS was derived from the 44 farmer responses to the disease risks that they as individuals face.

The first step in generating a BCS was to score each individual biosecurity control indicator (Appendix 10). Biosecurity indicators included the source of poultry feed, the actions taken to minimise pest and rodent entry, and the number and type of signs installed around the farm.

Most of the indicators were allocated scores ranging from 1 to 3 (1 being low biosecurity, and 3 being high biosecurity). For example it is more biosecure to purchase farm inputs (indicators 1B to 1E) direct from the contractor or feed company (a score of 3) rather than from a poultry shop (score 2) or from another farmer (score 1). There are several indicators that have a broader range of responses, and therefore a broader range of scores. One of these was *3C: Parking and vehicle washing*. Low biosecurity with regard to this indicator (a score of 1) meant there was no designated parking area, no car wash area and no high pressure pump available to clean vehicles as they enter. High biosecurity (a score of 7), indicated that a car park, car wash area and pressure pump were present. Scores of 2 to 6 indicated the presence of some but not all of these facilities.

The BCS was calculated by summing the biosecurity stage scores. This was a simple method which made no judgment with regard to the importance of each indicator in influencing on-farm biosecurity. It valued each of the biosecurity indicators equally.

### 7.3.3 Using the biosecurity control score

The BCS suggested that in Bali broiler smallholders have a significantly higher adoption of biosecurity activities than do layer smallholders. In West Java the result was quite different, layer farms had significantly higher BCS scores than broiler smallholders. In Bali, broiler smallholders have a higher biosecurity score for all control stages except *traffic onto farm*. In West Java broiler smallholders tend to purchase their inputs from more biosecure sources, however, layer smallholders had significantly higher biosecurity scores for the risk stages; *biosecurity at farm gate* and *susceptibility of flock*. Layer farms tend to be laid out or structured in a more biosecure manner with a higher likelihood of having poultry sheds further from potential sources of disease. They also have better biosecurity at the farm gate.

Rearranging the data by farm type allowed comparison of layer farms in Bali and West Java and broiler farms in Bali and West Java. When comparing farms within the provinces, there were two noteworthy results. Firstly, layer smallholders implement significantly more biosecurity measures in West Java than they do in Bali. Secondly, there was no real difference in biosecurity status on broiler farms between the two provinces.

To take this analysis further farm responses at the risk level stage were compared. There were significant differences between the broiler smallholders in Bali and in West Java. Broiler smallholders in Bali had better biosecurity between the farm gate and the shed.

Amongst layer smallholders, there were also significant differences. Generally, layer smallholders in West Java had higher biosecurity scores than those in Bali. There were significant differences in five of the seven control stages. Layer smallholders in West Java sourced their farm inputs from more biosecure sources, and had better-structured farms than the smallholders in Bali. Their sheds were positioned further away from potential sources of pest and disease; had more biosecure infrastructure and management practices at the farm gate, and; had more biosecurity measures at the entrances to poultry sheds.

The development of the BCS was the underpinning of examining what factors affected biosecurity adoption.

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## 7.4 Factors affecting adoption of biosecurity

Using the BCS to compare farmer adoption showed that in Bali, broiler farmers had higher adoption levels than layer farmers. In West Java, on the other hand, the biosecurity adoption in layer farms was higher than in broiler farms. In West Java, the implementation of biosecurity measures in layer farms was better than in broiler farms particularly at farm gate

stage. In Bali, almost at every stage the implementation of biosecurity measures in broiler farms was better than in layer farms.

There was significant correlation between biosecurity implementation and farmer and farm characteristics in layer farms. Farm characteristics that were significantly correlated with adoption were age, education, and farming experience. There was also significant correlation between the level of adoption and farm characteristics such as number of sheds, land area of farm, capacity of farms, ownership type, and management type. In broiler farms, variables that were significantly correlated to biosecurity control were the number of sheds, total capacity of all farms, average capacity of all sheds and management type.

Using the BCS as the dependent variable, this study identified the potential factors that influence the adoption of biosecurity activities. The regression analysis identified that older more educated farmers with larger families of are more likely to adopt better biosecurity in layer and broiler farms. On layer farms, farmers with fewer non-poultry sources of income will have better biosecurity.

The farm characteristic that may influence biosecurity adoption in both layer and broiler farms is land area of the farm. In broiler farms the number and average capacity of farms are also important. The analysis suggested that variables related to farm size had a positive impact on biosecurity control; the larger the farm the better the biosecurity. The distance of layer and broiler farms from neighbour's poultry and nearest road was also important; the greater the distance the better the biosecurity.

This research provided some practical guidelines as to the type of farm and farmer more likely to have higher levels of biosecurity. It provided a basis for selecting farmers who may be more likely to want to be involved in project activities (e.g. training and producing 'Healthy Farm' products) and some guidance as to the characteristics of farms and farmers that the project should encourage if hoping to improved adoption.

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## 7.5 Development of protocols and minimum standards

It was important for the project to implement best practice when visiting farms and assist the national and provincial governments develop appropriate policies to encourage value chain biosecurity and hygiene. All project led farm visits followed the protocol developed by the project (Appendix 11).

Developing minimum standards for NICPS farmers was always difficult and something the project was very careful about. On-farm biosecurity and the activities required to be adopted by a farmer would vary between farms depending on their particular risk framework. For example a farm separated from others or far from roads may have different requirements for fencing compared to other farms who were in dense farm areas and/or near busy roads. A simple set of minimum standards was provided for discussion (Appendix 12). It attempted to not be prescriptive but rather outline the farm conditions that need to be in place.

Although the slaughterhouses that the project worked with had, or were in the process of obtaining NKVs, the project also assisted with development of protocols and Standard Operating procedures (SOPs) to ensure that products from project farms were treated separately and hygienically (Appendix 13).

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## 7.6 Consumer survey

A survey of consumers was undertaken in 2010 in Bogor, Denpasar, and Makassar. The aim of the survey was to examine whether or not supermarket consumers valued the fact that the meat or egg product they were purchasing was from a farm that implemented biosecurity practices. The survey was careful to measure the characteristic of 'source farm' rather than trying to sell product quality. A total of 240 consumers shopping at 11 supermarkets were

surveyed. The surveys were conducted by Udayana University in Bali, ICASEPS in West Java and Hasanuddin University in South Sulawesi. It was decided to limit the survey to supermarket consumers as it is within these markets that it was expected that consumers would have the capacity and desire to pay a premium.

In order to assess the perception of consumers to this attribute, respondents (consumers who purchase poultry products at a supermarket) were offered a choice between two products. The first being a regular whole chicken, the second being a chicken from a biosecure farm. Consumers were provided with photos of an approved farm and a similar size and location unapproved farm. They were also shown photos of the packaged product from the approved farm and a regular chicken product. The consumer's willingness to pay a premium was measured using elicitation techniques.

Over 75% of respondents purchased poultry products at the supermarket. The reasons for purchasing there include; better or at least more consistent quality of product, easier access and enjoyment of 'mall' shopping. Of those consumers surveyed in Bogor, 92% stated that they would be prepared to pay more for products from approved, biosecure farms. 48% of respondents stated that they would pay a premium up to 10% above the regular price and 43% said they would pay more than this (Table 4). The average willingness of respondents to pay more for chicken meat from biosecure farms in Bogor was Rp.2,990<sup>2</sup>/kg, this is in addition to Rp.24,160/kg for regular chicken. Respondents at the supermarkets in Bogor, therefore, stated that they would be prepared to pay approximately 12% more for chicken meat.

**Table 4: Consumer's willingness to pay for broiler chicken: Bogor, West Java**

		Respondents (%)
No premium	Rp.24,160	8
Premium of up to 10% above regular price		48
Premium of between 11 and 20%		29
Premium of between 21 and 30%		12
Premium of greater than 30%		2
Average premium – all respondents	Rp.2,990	100

Respondents were asked about the most important characteristics of the meat product that they consider when purchasing. The most important criteria, particularly among the female respondents, was that it was *halal*. It was also important that it was regarded as a 'safe' product. Confirming the understanding that food safety is becoming increasingly important to Indonesian supermarket consumers.

In Makassar 92% of respondents believed they would spend more on this product if it was available (Table 5). Their stated willingness to pay, however, was lower than the estimates in Bogor. The margins they would be prepared to pay were Rp.2,140/kg. The existing prices for ordinary chicken meat in Makassar was similar to the price in Bogor at Rp.24,400/kg. This was a premium of 8.8% compared to regular products.

For all respondents the main driver for selection was that the products be *halal*. This was important for both males and females. There were no gender effects influencing the perceptions of consumers in Makassar.

<sup>2</sup> An exchange rate of Rp.9,000 = A\$1 is used in this study

**Table 5: Consumer's willingness to pay for broiler chicken; Makassar, South Sulawesi**

		Respondents (%)
No premium	Rp.24,400	10
Premium of up to 10% above regular price		50
Premium of between 11 and 20%		38
Premium of between 21 and 30%		2
Premium of greater than 30%		0
Average premium – all respondents	Rp.2,140	

In Denpasar, the willingness of respondents to pay more for poultry products from biosecure farms is presented in Table 6. Most consumers (94%) state that they would be prepared to spend Rp.5,000 higher than the regular price of a whole chicken. One consumer would spend between Rp.5,000 to Rp.10,000 higher than the usual price, and one more stated that he/she would spend more than Rp.10,000 above the regular price.

**Table 6: Consumer's willingness to pay for broiler chicken; Denpasar, Bali**

		Respondents (%)
No premium	Rp.23,500	0
Premium of up to Rp.5000 (21% above regular price)		94
Premium of between Rp.5,000 and Rp.10,000 (40%)		3
Premium of greater than Rp.10,000		3

The majority of respondents stated that they would pay more for products from biosecure farms. On average, household consumers were willing to pay approximately 10% more for meat products and 12% more for eggs from biosecure farms.

The income level of the household had an influence on the willingness of consumers to pay more for these poultry products. It was important in Bogor and Makassar that the product was *halal*, but there was no relationship between willingness to pay and age, education and occupation.

## 7.7 Towards defining cost-effective biosecurity conference

The aims of the conference were to:

1. Present the results of the most recent research undertaken to identify cost-effective biosecurity for NICPS farms
2. Identify areas where collaborative research work can be undertaken by Indonesian and donor agencies
3. Establish a process and timeframe for the implementation of cost-effective biosecurity in NICPS farms

It brought together researchers who were directly involved in improving biosecurity in smallholder layer and broiler farms in Indonesia. While it may be simple to identify biosecurity activities, it is not a simple task to ensure adoption of these activities on smallholder farms. There needs to be incentives and institutions that support this implementation process. Government needs to continue to develop policy and regulatory support, while the poultry industry needs to develop market structures that are able to

provide economic incentives for smallholders to invest labour and capital in improving biosecurity. Smallholders with limited capital need to be able to select the biosecurity activities that will have the major impact on reducing losses from pest and disease for the least cost. Priority activities that are not only effective but are cost-effective need to be selected for individual NICPS farms. This workshop worked towards identifying these cost-effective risk reducing activities.

A two-day conference Adoption of Cost-Effective Biosecurity for Non-Industrial Commercial Poultry Sector Farms in Indonesia in Bogor in June was organised by the project. Fifty seven delegates represented donors, industry, academia and central and provincial governments. The 17 presentations included research papers from the abovementioned surveys. Three project team members presented papers at the AARES Conference in Melbourne in February.

The details of the conference (e.g. agenda and list of participants) is provided in Appendix 14. Full copies of the papers are available on the project website (<http://www.une.edu.au/research/research-centres-and-institutes/institute-for-rural-futures/international-development-research/?a=14763>)

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## 7.8 Pricing study

Another step in understanding the potential for consumers to purchase products from biosecure farms was to discuss with all value chain stakeholders their expectations of the processes and their benefits of their involvement. The objective, therefore, was to determine an appropriate value chain and pricing structure for the poultry products from biosecure farms that would deliver mutual benefits to all participants in the CMC. The study was conducted in the three provinces (Bali, South Sulawesi and West Java) in October and November 2010. Primary data were collected through interviews of identified stakeholders.

The pricing study found that due to the size of the trial and the characteristics and existing relationships between farmers, RPA and supermarket the structure of broiler CMC could be reduced to involve just contract companies, farmers, RPA and supermarket. The broiler CMC market chain participants are highlighted in Figure 1.

### **Figure 1: Stakeholders in the CMC broiler market chains**

The study also began a discussion concerning the extra costs required for farmers to prepare their farms and the expected benefits of all the CMC stakeholders. The perceived extra costs to be incurred by each participant are provided in Table 7.

**Table 7: Identified costs in implementing biosecurity measures at broiler farms**

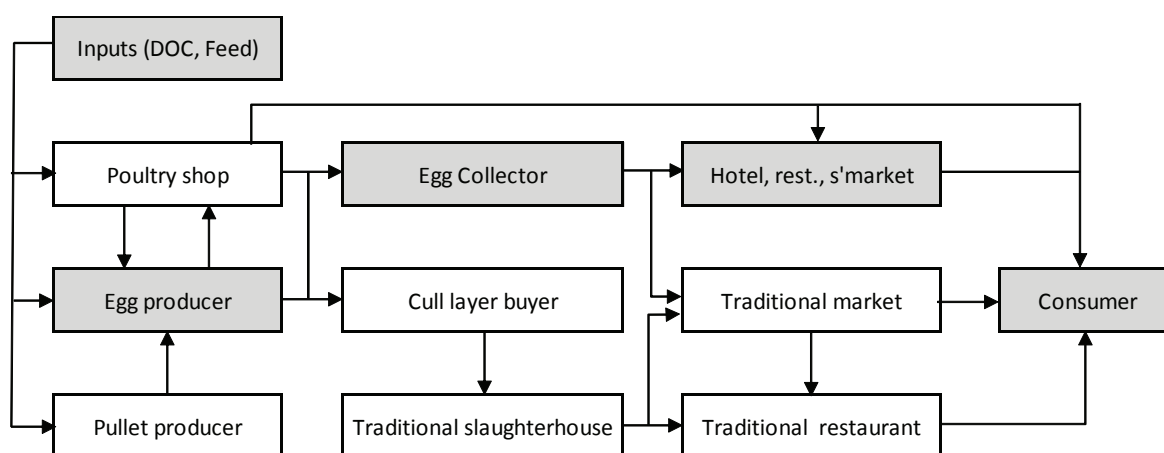
Description	Cost
Farmer	Fixed cost: Front gate (Rp.2,000,000), Fence (Rp.2,000,000) Footbath (Rp.1,000,000)
Slaughterhouse	Fixed cost: Packaging machine, Colour coded basket, Stainless steel table Variable cost Packaging cost (labour and materials) Rp.1,000 per bird
Supermarket	Variable cost Packaging cost (labour and materials) Rp.900 per bird

The expected gross margin for products from biosecure farms varied among stakeholders along the chain. Farmers expected to receive a premium of between Rp.800 to Rp.1,800 per live bird. While contract companies such as MSJ and UJADI in Bali, and Ciomas in South Sulawesi did not expect any additional profit from CMC products, others such as PPC and PPM in West Java expected to receive additional profit from CMC products of between Rp.1,000 and Rp.2,000 per kg. They would be prepared to distribute these profits to their farmers.

Slaughterhouses in Bali and West Java expected to receive an extra Rp.1,500 to Rp.2,000 per bird to cover the perceived extra handling costs. At the supermarket in Bali, handling cost (packaging) was estimated to be about Rp.900 per pack and they expected to receive 4% profit margin from premium poultry products.

The study concluded that the contract company plays a significant role in influencing adoption of biosecurity activities. It is possible for contract broiler farmers to receive the premium price if the potential contract company is willing to modify its conventional contract system.

The three major egg CMC participants are the layer farmers, egg suppliers and supermarkets (Figure 2). Most layer farms are owned and managed independently of contract companies. In Bali, 97% of layers farmers were independent compared to 18% of broiler farmers.



**Figure 2: Stakeholders in the CMC egg market chains**

Once again, stakeholders estimated the potential benefits they expected to receive from being involved in a premium niche market. The amount of extra income from eggs sought by the layer farmers ranged from Rp.500 to Rp.2,000 per kg. The egg supplier in Bali expected to receive an additional Rp.100 per egg. Even though the supermarket did not expect any additional income, they requested promotion of the product within the supermarket.

The pricing team concluded there was potential to develop a CMC for products from biosecure farms with a premium price sold in high-end retail outlets. However, a wide range of issues and difficulties along the market chain exist. The economic incentive (e.g. premium price) should be combined with an estimation of other potential benefits such as an increasing productivity and reduced risk in order to encourage CMC stakeholders to change their production attitude and behaviour.

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## 7.9 Development and implementation of 'Healthy Farm' product markets

### 7.9.1 Background

The consumer survey and the pricing study provided evidence that consumers would be prepared to pay more for products from approved biosecure farms and that the concept of safe and clean food is important. The next question, therefore, revolved around the ability of the market chain to produce the required products at a price within the range determined by the survey. This required the development of an efficient market chain that produced products from 'approved' farms and sold them for a premium price in a supermarket. The following section describes the process undertaken to develop the clean market chain. It details the activities undertaken by project personnel and methods used to prepare for a product launch into supermarkets in June 2012. The project was conducted in three cities in Indonesia; Bogor (West Java), Denpasar (Bali), and Makassar (South Sulawesi).

#### **Bali**

The market for poultry in Bali was approximately 120,000 to 130,000 birds a day, serviced by a shed capacity of approximately 6 to 6.5 million birds. The industry is dominated by seven national companies, some of which are multi-nationals. The two largest companies, PT. Charoen Phokphand and PT. Japfa Comfeed, control approximately 70 to 80% of the market.

Bali is an important area as it has a developed tourist and supermarket sector demanding safe, clean, healthy products. It was regarded as a useful case study area as it provided a more modern market alternative to the other two provinces. Potentially, there may be greater potential for this niche product to be successful in this market. There is also continued evidence of HPAI in the province and a determination by the Provincial Government to eradicate the disease.

#### **West Java**

Bogor, West Java is situated close to Jakarta. There is demand for approximately 1,000,000 birds a day into the Jakarta market. Currently, 85% of poultry products are sold at 200 traditional markets, the remainder to the supermarket (FAO, 2004). There is potential to increase the proportion sold in supermarkets. Bogor is itself a municipality of 5 million people so demand into this market is also significant.

Due to the very high risk presented by the Jakarta market chain, the government is working towards all poultry in Jakarta being marketed via a chilled market chain, thereby removing the disease risk posed by wet markets. There are new policies being implemented that limit the transport and slaughter of chickens in Jakarta meaning that neighbouring *Kabupaten*,



including Bogor, will have increasing importance in supplying poultry products, rather than chickens, to this market. This has big implications for the market chain in West Java.

### South Sulawesi

The poultry industry in South Sulawesi is dominated by three large companies, PT. Charoen Phokphand, PT. Japfa Comfeed and PT. Sierad. There are some 15 subsidiaries supplying a market of approximately 1,000,000 broilers a week. There are also approximately 4,000,000 layers in the province.

The poultry industry is less varied than both Bali and West Java as there are less high end consumers, and less influence of expatriate and tourist communities. However the production facilities are quite sophisticated due to the presence of the Ciomas (Japfa Comfeed) factory that produces large quantities of sausages for markets in Kalimantan and Papua. Makassar is also an important thoroughfare for trade from Java to the Eastern Islands and potentially important source of disease movement. DOCs and feed sourced from Makassar itself are traded through to Bali, NTB and NTT.

### 7.9.2 Timetable for implementing the ‘Healthy Farm’ trial

With the institutions established and protocols in place, there was a period of preparation before the products were actually launched in supermarkets in the three case study areas. The preparations required involved getting the farms approved by the PBUI and producing advertising and packaging materials. These activities were undertaken between March and June 2011 (Table 8).

**Table 8: Timetable of major activities leading to product launch**

Pre-launch activities 2011	March	April	May	June
<i>Signs, T-Shirts, packaging, flyer, booth,</i>				
- design	■	■		
- production		■	■	
- delivery			■	
<i>Farm planning - implementation,</i>				
- audit	■	■	■	
- accreditation		■	■	■
<i>Staff training</i>				
- Farm		■	■	
- RPA		■	■	
- Outlet SPG and SPB			■	■
<i>Venue setup</i>				
- Bogor			■	
- Makassar				■
- Bali				■

### 7.9.3 Farm signage, product packaging and video production

The project initially supplied farm biosecurity signs, egg and meat packaging, brochures describing the characteristics of the ‘Healthy Farm’ product for distribution to consumers in supermarkets, and other promotional materials such as T-shirts and ‘Healthy Farm’ booths for displaying the products in the supermarket. Each product has a ‘Healthy Farm’ logo (Figure 3) which attempted to convey the source of the product without making any claims with regard to product quality. The project also supported the supermarkets by providing trained assistants to help promote the products.



Figure 3: 'Healthy Farm' meat chicken logo

### Farm signs

A basic requirement of on-farm biosecurity was the use of signs on farm both warning staff not to enter restricted areas and also reminding staff of their responsibilities. Three types of signs were produced and distributed to participating farmers (Figure 4). These signs were made of aluminium and cost Rp.150,000 each. Each sign had the PBUI logo and clear pictorial and worded messages regarding what was required.



Figure 4: Farm biosecurity signs: (a) farm office, (b) farm gate, (c) shed door

### Product packaging and consumer information

The project supplied initial packaging materials for both chickens and eggs. Each province received 650 cardboard egg cartons (Figure 5) costing Rp.3,100 each. After these cartons were used each egg market chain became responsible for supplying their own cartons. In

Bali, the chain continued to source cardboard cartons while in Makassar this was too difficult and expensive so they reverted to plastic cartons. In West Java the trial did not continue.



Figure 5: 'Healthy Farm' egg carton

Packaging for the meat chickens was also supplied initially by the project. Each province received 10,000 plastic bags with logos ('Healthy Farm', PBUI and appropriate provincial government institution) costing Rp.900 each. The Bali meat market chain decided that it would use styrofoam with plastic wrapping for the chickens being sold into Carrefour, so the project supplied stickers that could be attached to the plastic.

### Video and brochure production

Videos were produced for training and marketing by the PBUI, and advertising for 'Healthy Farm' brand prior to the product launch at the supermarket (Appendix 15). Brochures were also produced to provide information to the consumer regarding the product (Appendix 16). The claims were based around the fact that the product was produced on farms that had implemented agreed biosecurity plans. While there may have been some quality improvements because of the improved management systems, no claims with regard to quality or food safety could be made.

### 7.9.4 Identification of participants

At each of the locations, Bali, West Java and South Sulawesi, focus group discussions were held involving local government and all industry stakeholders. The aim of the focus group was to identify potential stakeholders who were keen to be part of the CMC trial and who were prepared to develop relationships with other stakeholders. More detailed discussions were then held through the 'Pricing Study Team' whose role it was to further strengthen the relationships and begin the process of developing a sustainable pricing system along the chain. Criteria for final selection of CMC participants included:

- Current extent of biosecurity measures and rules,
- Location with regard to other stakeholders,
- Existing supply arrangements between stakeholders, and
- Contractual arrangements between stakeholders suitable for the introduction of a new product.

The process of selecting CMC participant stakeholders varied between provinces. In West Java contact was made with a small, privately-owned RPA that was already supplying supermarkets and restaurants in Bogor. Through the RPA, supermarkets were identified. The farmers, however, were identified separately. In South Sulawesi, a vertically integrated chain was identified (managed by Japfa Comfeed/Ciomas) who had existing contacts with supermarkets and fast food outlets (e.g. KFC) in Makassar. This was regarded as ideal as the company could ensure the linkages between stakeholders were functioning. Japfa Comfeed had feedmills, imported good quality DOC, contracted its farmers and owned a modern RPA. In Bali, the supermarket and farmers were identified but there were difficulties identifying a suitable RPA. Eventually one was found which, similar to West Java, was small and privately owned and had existing contracts with the supermarket. Later (March 2013) the Ciomas RPA and contract farmers also became involved in the CMC in Bali. The following section details the selection process in the three provinces.

### **Contract companies and broiler farmers**

The selection process for broiler farmers began with discussions with the contract companies. The key consideration was whether farmers had been trained and the level of biosecurity implementation on the farms. Initially (by June 2012), there were 71 broiler farmers involved in the CMC trial (Table 9).

**Table 9: Number of Broiler Farmers Participating in CMC Project**

Provinces	Number of Farmers	Contract companies
Bali	20	MSJ and UJADI
West Java	30	Perdana Putra Chicken (PPC), Tunas Mekar Farm (TMF), Pandu Putra Mandiri (PPM) and Inasa
South Sulawesi	21	PT. Ciomas Commercial Farms (CCF)

In Bali, two contract companies, MSJ and UJADI, were selected as they provided support for farmers to implement biosecurity measures. They were also located in the same area, had existing relationships with the RPA and had been trained by PBUI. A total of 20 broiler farmers were selected from the two companies.

In West Java, GOPAN (*Gabungan Organisasi Peternak Ayam Nasional*) farmer association was appointed as the project counterpart. Therefore, farms that were members of GOPAN including *Perdana Putra* Chicken (PPC), *Tunas Mekar* Farm (TMF), *Pandu Putra Mandiri* (PPM) and *Inasa* were involved in the project. 30 farmers approved by PBUI were chosen.

In South Sulawesi, PT. Ciomas Commercial Farms (CCF) was willing to participate in the CMC project. Therefore, 21 broiler farmers from this contract company were selected.

### **Slaughterhouse**

Slaughterhouses handle and process the birds. Although the spread of disease is not an issue because of short time frame between transport and slaughter, CMC products need to be traceable so they can be differentiated from regular products in the market. The application of food safety measures, the ability to separate birds from biosecure farms and the ability to supply target supermarkets were the main considerations in selecting the RPAs. The slaughterhouse needed NKV certification (or to be working towards NKV certification) and pass a soft audit from PBUI to ensure these criteria were met. As a majority of Indonesians are Muslim, *halal* certification of the slaughterhouse was also important.

The Bali CMC Working Group was unable to select an NKV certified RPA. The certified RPAs on Bali were not interested as they believed they were unable to be sure that farms

were implementing appropriate levels of biosecurity. As a Carrefour supermarket had already been identified in Bali, other RPAs that had existing supply contracts were approached to be involved. Budi Jaya RPA was identified and willing to participate. This RPA had a sufficient capacity of 3,000 birds per day and were also supplying Lotte, KFC, Mydea and Hardys retail outlets. It had *halal* certification and was in the process of obtaining its government issued NKV. Although initially apprehensive about auditing requirements they were persuaded by Carrefour and agreed to be audited and advised by the PBUI.

In Bogor, CV. Jambu Raya was suggested by Dinas Pertanian and was selected as it had *halal* certification and was applying for the NKV. It is the only semi-modern slaughterhouse in Bogor City with production capacity of 10,000 to 15,000 birds per day. It is the main supplier of chicken meat (80%) at Yogya supermarkets in Bogor.

In South Sulawesi, Ciomas RPA was selected as it had both *halal* and NKV certificate. It is a semi-automatic slaughterhouse with production of 6,000 to 7,000 birds per day and employs about 50 workers. The average cost of slaughter is Rp. 230 per live bird. It sells its products to various customers, including hotels (Clarion and Hilton), restaurants (KFC, AW and Scolaria) and supermarket chains (Alfa Midi, Carrefour, Giant, Hero, Hypermart, Lotte and Ramayana).

### **Layer farmers**

The market chain for eggs from biosecure farms was only trialled in Bali and South Sulawesi. The marketing system in Bogor was complex with five big players controlling price and egg supply to the supermarket and unwilling to be involved. The project had trained some layer farmers (PINSAR members); however, they sold eggs in Jakarta and so were not suitable for the project.

In Bali many layer farmers were interested but were located too far from Denpasar. In addition, too much work and finance were needed to improve their farms. CMC Working Group members recommended involving MSJ. Their farms had sufficient biosecurity implementation and capacity (6,000 birds) to supply Carrefour Supermarket. The sale of 'Healthy Farm' eggs in Bali was not attempted until December 2012

In South Sulawesi, the independent Satria Jaya Farm was selected. It is located close to Makassar City and had good biosecurity, being a pioneer in biosecurity adoption. Some employees had been trained by the PBUI and it had a large capacity of about 35,000 birds, selling to supermarkets, restaurants, hotels and catering in partnership with the egg supplier, UD Rezky Utama.

### **Egg Supplier**

In Bali, Carrefour Supermarket recommended the egg supplier UD Limas. They supplied about 25,000 eggs per day to supermarkets, restaurants and hotels. The PBUI facilitated the linkage between the UD Limas and MSJ layer farms.

In South Sulawesi UD Rezky Utama was selected to be involved in CMC trial as it had an established relationship with Satria Jaya Farm. This egg supplier purchases between 700 kg to 1,000 kg of eggs per day from Satria Jaya Farm in order to supply supermarkets and hotels. It has supplied 40 cartons of eggs per day from biosecure farms to Lotte Mart since June 2011.

### **Supermarket**

Supermarkets are potentially the key drivers in a CMC. Of the many supermarkets in Bali, Carrefour (Kuta) was selected as it had the highest sales of broiler chicken. It was also suggested as it had higher end customers compared to other supermarkets. Carrefour sells about 50 to 150 packaged chickens per day and were very keen to participate in this trial. Carrefour supermarket was also selected to sell eggs.

Among several supermarkets operating in Bogor, three (Yogya Supermarket, Ada Swalayan and Matahari Foodmart) were initially identified to be involved in the CMC trial. Matahari Foodmart were invited to the first Focus Group Discussion and stated that they were willing to participate. However, their chicken products were not supplied by CV. Jambu Raya. The project facilitated registration for CV. Jambu Raya to become a new supplier, however, negotiations and the partnership broke down due to disagreements in the level of commission. Yogya supermarkets were, therefore, selected as the project team had conducted the consumer survey there and CV. Jambu Raya was already a contracted chicken meat supplier. Yogya Supermarket has two locations in Bogor. Yogya Cimanggu was initially appointed for launching the products by agreement with the manager. In 2010, however, the manager was appointed to manage the new Yogya Bogor Junction and so the project moved the launch there.

In South Sulawesi, Lotte Mart was selected because it was used for the consumer survey, had existing supply arrangements with broiler and layer farms and with RPA Ciomas. As such RPA Ciomas were able to register a new product easily. Lotte Mart was a wholesale supermarket servicing restaurants, hotels, catering and households. In June 2011, they opened a new outlet at Panakukang Mall which targeted end-user customers. Both these supermarkets participated in the trial.

### 7.9.5 The process of farm and RPA approval

#### *The farm*

Each farm was required to implement an agreed biosecurity farm plan which outlined what each smallholder would need to do, and how much it would cost, to be approved by the PBUI as a registered supplier. The Farm Biosecurity Plan (FBP) was, in fact, a biosecurity audit designed to advise the farmer what needs to be done to better restrict the movement of people, animals and equipment into and around the farm. Advice was given by a trained PBUI planner on what needed to be done with regard to physical infrastructure (e.g. fences, gates, locks, footbaths) and people management (e.g. staff movement, use of protective clothing, restriction on visitor entry). Farmers were then given a month to implement the FBP before an independent auditor (once again trained by the PBUI) returned to evaluate their progress and approve if appropriate.

The average overhead cost of upgrading these broiler farms to approved status was Rp.2.7million (US\$300). This included ensuring adequate fencing, gates, signage and footbaths. There were additional annual costs Rp.500,000 (US\$55) consisting of the purchase of new protective clothing and repairs and maintenance of the shed and surrounds. As well as these costs there were also extra costs incurred with every cohort. In the analysis it assumed that there are seven cohorts of broilers per year. The cohort costs include, detergents, vaccines, labour costs accessing quality fee and DOC etc. The cohort costs were estimated at Rp.250,000 (US\$27) per cohort or Rp.1.75million (US\$190) per year. On average each farm in Bali had an expected net annual income of Rp. 73.3 million (US\$8,100), which assumes seven cohorts a year and an average farm size of 4,900 birds per cohort.

In Bali a total of 28 broiler farmers have been audited and another 40 are presently undergoing training and farm plan development. There is only one layer farmer supplying the 'Healthy Farm' product to the two participating supermarkets in Makassar.

#### *The slaughterhouse*

As the slaughterhouse is the end point in the production cycle, biosecurity is not an issue as the time between delivery and slaughter is insufficient for disease transfer. Issues for the RPA were hygiene and the ability to separate CMC chickens from regular chickens both entering and exiting the slaughterhouse. Slaughterhouses involved in the project already

held or were working towards NKV certification from the Dinas covering standards of hygiene and food safety. The project worked with the RPA and Dinas to facilitate progress in NKV certification. In addition, the PBUI undertook a soft audit of the slaughterhouse to ensure the separation of biosecure chickens during transport and processing. This included developing protocols using different coloured boxes to ensure ease of separation and minimise any errors during the transport of the chickens to the supermarket. Separation during processing was achieved by processing biosecure chicken first each morning then normal chicken followed.

### 7.9.6 Launch of the 'Healthy Farm' product

With farmers and advisors trained, farmers implementing their approved farm biosecurity plans, slaughterhouses implementing improved hygiene and product separation processes, the scene was set to launch the 'Healthy Farm' products in the three provinces. The 'Healthy Farm' products were launched in the three supermarkets in June 2011 (Figures 6 and 7). The launch of the product was accompanied by the provision of specialised sales assistants for 3 days in Bogor and Makassar and one month in Bali. At all stores price discounts were also offered to encourage purchase. In Bogor the 'Healthy Farm' chickens were sold for Rp.15,450 per bird, a 25% discount on the recommended price. These pricing and marketing decisions were the responsibility of the supermarkets, supported by the project. There were initial problems in both Bogor and Makassar with regard to the meat chicken marketing. While there was 'Healthy Farm' product available at the Yogya supermarket in Bogor, the supermarket management was not keen to sell a product which was making claims that made their regular product appear to be inferior. While they allowed the Project staff to sell the product and distribute the brochures which explained the background to the product, they did not allow us to use the packaging. Support for the product was provided for three days but then decided that there was insufficient support to continue with the trial. Clearly, there had not been adequate buy in from the supermarket which soon encouraged the RPA to cease processing the 'Healthy Farm' chickens.



Figure 6: 'Healthy Farm' Product launch in Makassar, June 2011



**Figure 7: Brochures and the supermarket booth at the ‘Healthy Farm’ product launch**

In Makassar, ‘Healthy Farm’ chickens and eggs were launched in the Alauddin Lotte Mart. This supermarket targeted mainly commercial consumers (e.g. small markets, restaurants) rather than household consumers. Both eggs and chicken meat ‘Healthy Farm’ products were launched with three days of sales support provided. Both products sold successfully and both products were launched at a Lotte Mart more focussed on household consumers in January 2012. Difficulties in sustaining continuity of supply to these supermarkets ensured that the ‘Healthy Farm’ meat chicken product was available for only a few months in each store. ‘Healthy Farm’ eggs have been successfully integrated into the supermarkets product range.

‘Healthy Farm’ chickens were successfully launched in the Carrefour supermarket in Bali in June and eggs in January 2012. These products continue to sell and along with eggs in Makassar are discussed in more detail in the following section.

### 7.9.7 Broiler chicken in Denpasar

Table 10 provides the detail of the trade in broiler chickens between the RPA and the supermarket in Denpasar, Bali. The trial started in June 2011 with high sales during the first month due to aggressive marketing in the supermarket. In July 2011, 46% of the chickens purchased from this RPA were bought as ‘Healthy Farm’ chickens this decreased to 28% in September 2011 and has levelled off to 15 to 20% since then.

**Table 10: Sales of regular and ‘Healthy Farm’ chickens by the slaughterhouse to the supermarket – July 2011 to July 2012**

	Jul-11	Sep-11	Nov-11	Jan-12	Mar-12	May-12	Jul-12	Average
Regular farm chicken								
No. of days purchased	30	29	30	27	26	30	31	29
Total purchased per month	2073	2277	2,136	2323	2371	2395	2125	2127
Average price per chicken (Rp.)	23,467	23,638	23,433	27,481	24,288	26,413	29,387	25,753
Healthy Farm' chicken								
No. of days purchased	21	15	9	9	9	11	7	11
Total purchased per month	1770	890	390	380	390	418	371	546
Average price per chicken (Rp.)	27,143	28,800	28,000	29,333	28,000	28,727	34,143	28,923



The sales results do show that the RPA is receiving an economic benefit for selling the branded chicken. With an average price increase of 12% for the new product and an average of 546 chickens per month receiving this premium, the RPA is receiving a benefit of Rp. 1.73million (\$US192) per month for minimal cost. Apart from of a few cool boxes and some implementation of new transportation protocols there are no extra costs incurred by the RPA in processing the 'Healthy Farm' chickens.

The RPA delivered directly to a large modern supermarket in Denpasar who were responsible for the packaging and labelling of the product before it went onto the supermarket shelf.

As mentioned, demand for the product was high in the initial period after the launch in June 2011. For the first month, trained, designated sales assistants distributed information on the product and encouraged consumer purchase. It was important to educate the consumer as to what they were actually being asked to pay for. It was necessary to stress that the characteristic of the product being sold was not necessarily a healthier product, but a product from a trustworthy clean source.

It was of course, expected that the product would meet the required food safety standards required of all products with being sold in the supermarket. As the product was sold as fresh produce there was no need for some of the approvals required of processed products. Even though the government could not 'certify' the farms or provided official accreditation, the provincial government in Bali did provide a 'permission letter' (*surat keterangan*) which gave us permission to sell the product with a provincial Government stamp.

As can be seen from Tables 10 and 11 there was a price margin between the RPA and the supermarket. The average price to the consumer is 24% higher than the purchase price from the RPA. Apart from the supermarket's profit there are two major reasons for this. The first is that the packaging and labelling costs are being borne by the supermarket. The chickens are packaged in Styrofoam and plastic with the materials costing Rp.1,630 per chicken<sup>3</sup>. The second factor is the significant percentage of unsold 'Health Farm' chickens at the supermarket. While on average 546 chickens per month are purchased by the supermarket only 345 (63%) are actually sold for the premium price. Those that are not sold on the day they are processed into other products.

**Table 11: Sales of 'Healthy Farm' chickens at the supermarket – July 2011 to September 2012**

	Jul11	Sep11	Nov11	Jan12	Mar12	May12	Jul12	Sep12	Avge
Number sold	785	484	250	216	260	262	308	245	345
Average price (Rp.ch)	31,595	33,200	32,900	35,342	36,900	36,901	37,923	4,0520	35,892

With regard to regular chickens, the supermarket sells approximately 100 per day (3,000 per month) so during the study period (June 2011 to September 2012) 'Healthy Farm' chicken has accounted for approximately 10% of total whole chicken sales. There is a significant price differential between 'Healthy Farm' chickens and regular chickens sold at this supermarket. The regular chickens have sold at an average price of Rp.26,000 in the last 12 months, this is Rp.9,892 (\$US1.10) or 38% lower than the 'Healthy Farm' chickens. The desire for the supermarket to not only continue selling the product but also expand the production of 'Healthy Farm' chickens to a second slaughterhouse and a new group of farmers indicates that the concept may be viable and sustainable into the future.

<sup>3</sup> The styrofoam cost Rp.550 each, the plastic Rp.80 and the label Rp.1,000

### 7.9.8 Eggs in Makassar

Eggs are selling in two supermarkets in Makassar, the first is a wholesale market (Alauddin) and the second situated in a consumer area (Panakukang). At the Alauddin market eggs have been selling in cartons of 10 for Rp.13,200, this equates to Rp. 1,320/egg. The regular eggs sell by the kilogram and have been selling for on average Rp.14,900/kg or Rp.930/egg as there are usually 16 eggs/kg. This provides a profit per 10 eggs (a carton) of Rp.3,900. However, the actual cost of the cardboard carton is Rp.3,100 each, leaving a profit to be divided between the farmer, egg seller and supermarket of only Rp.800/egg (US\$0.09). This may not be sustainable in the longer term.

At the Panakukang supermarket eggs have been selling at the higher price of Rp.15,000/carton, (Rp.1,500/egg). Regular eggs have been selling for Rp.15,400/kg, approximately Rp.960/egg. This is a price increase of 56% for 10 packaged, 'Healthy Farm' eggs over the purchase price of 10 unpacked generic eggs.

The price differential per carton (10 eggs) is, therefore, Rp.5,400. Even with the cost of the carton, this equates to a profit of Rp.2,300/egg (US\$0.26). With sufficient quantity of sales, the selling of 'Healthy Farm' eggs at Panakukang supermarket may be sustainable. In 2012 the egg supplier and the supermarket have agreed to market the eggs in plastic cartons costing Rp.1,500 each. These are cheaper and more accessible in Makassar. The previous cardboard cartons had to be sourced from West Java Province and cost Rp.3,100 each plus transport.

The system of delivering a consistent quality of eggs is simple compared to that of broilers. In Makassar the trade is driven by a very dynamic farmer through one egg buyer. The producer is large enough to ensure that there is sufficient 'Healthy Farm' eggs available every day. At present sales are averaging 70 cartons per month at Panakukang and 50 cartons a month at Alauddin. This is a relatively small profit of Rp.273,000 (US\$30) and Rp.120,000 (US\$13) per month respectively. This is not a highly profitable, but the producer and egg buyer see the potential to develop the market further and work together to do this. Also there are no significant management processes that need to change within the market chain to obtain this profit.

The most important thing in the egg industry is trust between the producer and egg buyer. Even though their profit is small, there is potential for the farmer, egg buyer and supermarket to develop this relationship in the future.

### 7.9.9 Lessons learned from the "Healthy Farm" trial

The varying degrees of success in the three provinces were due to several often interacting factors. Some problems arose due to the nature of the trial (e.g. small scale of operations), while others will provide useful lessons. The most important were the contractual arrangements between stakeholders. These either caused problems for continuity of supply or impacted on the flow of price premiums down the chain, preventing the financial incentives from getting to farmers, where they were intended to flow. Most problems could be said to arise from existing arrangements and changing those arrangements was not viable for a small scale project. Therefore any sustainable market penetration will need structural change to address such issues. Although many of these problems were significant for a small trial, they would be manageable for an ongoing product supply. The trial was to prove a concept and the ongoing and increasing sales in two locations was successful. It would be expected that some companies will bring their own premium products to market in the near future.

#### *Smallholder and the contract company*

The price premium didn't flow back to the smallholder for a number of reasons:

1. Smallholder farmers, on average, manage seven cohorts per year, keeping the birds on the farm for between 28 and 32 days. It is expected that they will sell the entire cohort (average 4,900 birds) at the same time. That is, an 'all-in all-out' system. This is easier for transporting, managing the next batch of DOCs and also important for disease control. The trial is on average only selling 500 'Healthy Farm' birds per month which is a long way short of the scale required to make it beneficial to the farmers. For there to be a market incentive for the smallholder to invest in improved biosecurity there needs to be a greater demand in supermarkets and traditional markets.
2. The contractor controls the sale of the product, therefore the smallholder cannot gain direct access to the approved slaughterhouse unless the company organises it.
3. The present trial expects smallholders to cover the full cost of improving biosecurity and becoming an approved producer. However under the contract system, while there is the potential for smallholders to receive a bonus from a higher than guaranteed price, the benefit is never fully passed back.
4. The contractor is unlikely to subsidise or support the smallholder to improve their biosecurity and therefore enter a cost sharing arrangement as smallholders are on flexible, usually short-term contracts that allow them to move between companies quickly and easily.
5. Some contracts with farmers contain various clauses for premiums associated with increased efficiency and lower mortality, but no payment directly linked to implementation of biosecurity. Some contract companies argued that farmers would benefit from increased productivity and reduced mortality associated with the improved health of animals in biosecure farms. In some cases they, therefore, refused to pass on any premium during the trial.

### ***Contracts between RPAs and contract companies***

Contractual arrangements between contract companies and RPAs also impacted on the trial results. However most of these were to do with the scale of the trial and would not be an issue for implementation at an operational scale. Existing arrangements meant that the RPA in Bali had supply difficulties as existing contract company customers were given first priority. In Bali and Bogor there were also problems where only small quantities sufficient for the trial were being collected from biosecure farmers making transport arrangements inefficient. Payment arrangements were also different for new customers. Payment was needed up front rather than short term credit creating cash flow problems. All these problems would not be expected in larger operations where arrangements become permanent.

### ***DOC scheduling in Bali***

In Bali, the farms selected were contracted to two companies willing to cooperate with the project; MSJ and Ujadi. Of the original 20 farms involved in the CMC, 10 were contracted to MSJ and 10 to Ujadi. None of companies had biosecurity incentives for farmers but setup a different ordering system for birds from biosecurity farms. The capacity of sheds owned by the farms was between 4,000 to 13,000 birds. Due to similar scheduled dates of DOC check in there were only 12 different harvest dates for the 20 farmers.

Both companies had existing schedules for DOC check in, and it was difficult to change these as it would affect the schedule for all producers in Bali. Therefore, the project farmers were forced to follow the scheduled DOC check in resulting in no chicken harvesting for one period of twelve days. To have a farmer harvesting every day and delivering to the RPA would require at least 45 farmers to be involved in the program.

### ***Contractual arrangements between RPAs and supermarkets***

The contractual arrangement between the supermarket and the RPA was important in influencing the success of the trial. As with contract companies the selection of the RPA was

based on the RPA being an existing supplier to the supermarket. This was not the case in South Sulawesi and caused difficulties and delays in starting the trial.

In Bogor there were a series of issues from the supermarket down to RPA and farmers that contributed to its failure. However, most of the issues related to the lack of a new cost code for the product. A new cost code was required from the supermarket head office to sell the new product line (at a higher price than regular chicken), even though the RPA was already a supplier. The supermarket stated this needed to be gained from head office by the supplier. The project coordinator attempted to facilitate this for the RPA but was unsuccessful. As a result the 'Healthy Farm' chicken had to be sold at the same price at the launch. This caused a series of other problems. The RPA was unhappy as there were extra costs involved in transportation and handling of biosecure chickens but the price was the same. One cause of the extra cost was associated with the location of the biosecure farms and the low volumes being collected, resulting in only partially loaded trucks. Of the farms in the project only some were existing suppliers of small quantities to the RPA and they were located further away than normal suppliers. He stated he would be happy to sell biosecure chicken for the same price if it was cost neutral, however this was never the intention of the CMC project and would require significant volumes. The supermarket was not happy as it was now selling two products from the same supplier for the same price, one that was biosecure and one not. The manager became concerned that customers wouldn't buy non-biosecure chicken or any chicken at all when they saw biosecure and non biosecure being sold from the same non-NKV certified supplier for the same price.

### ***Nature of the market and perceptions of food safety and biosecurity***

The traditional market where most chicken is sold provides consumers the opportunity to inspect live birds and therefore be sure the bird is ASUH. The major move to a chilled market requires increased confidence in the safety of the chilled market chain. For example at some markets there is increasing use of chilled bins for storage of leftover birds. This is a positive development as it decreases the movement of live birds back to farms, however, it has the unexpected consequence that consumers perceive leftover birds as inferior as they were not sold on the previous day.

The overlap of concepts of biosecurity, food safety and healthiness occurred with all stakeholders from consumers to supermarkets and government officials. The name 'clean market chain' suggests a concept covering biosecurity at farm level, to segregated transport, to certified slaughterhouse facilities and chilled marketing in supermarkets. The brand name 'Healthy Farm' focuses on the farm but also implies that the product has health benefits to the consumer.

Supermarkets and government officials were just as concerned with food safety issues at the RPA and supermarket as with farm biosecurity. For example one government official challenged the proposition that food safety was a separate issue to biosecurity. From her perspective the issues are closely interrelated. From the regulator's perspective the issues all come under public health for which they are responsible. Supermarkets and food chains generally conducted audits at RPA's but not at farms. One company in Bogor that has contract farmers and an RPA has an internal audit system. They also test for salmonella, *E. coli*, and antibiotic levels and provide certification for restaurants. It would be a small step to include biosecurity certification as well if the market demanded it. Food safety appears to be an issue that is better understood, perhaps because more people have direct experience with it. From an outlet and consumer perspective this view is logical given the risks. Although HPAI is zoonotic it presents no health risk from consuming properly prepared and cooked meat.

From the supermarket perspective the 'Healthy Farm' chicken offers another premium product choice for the consumer, which most of the supermarkets were interested in due to a lack of existing brand variety. So even if a product is superior in terms of origin it will be

difficult to sell if it's not perceived as a healthy and quality product. One government official offered the view that young people preferred KFC because it was healthier due to superior food safety and auditing by the company.

From an Indonesian consumer perspective, quality of food appears most concerned with food safety. This is quite understandable if food security has presented problems in the past and awareness is high. The majority of stakeholders called for a public education campaign about biosecurity and there are examples of certification schemes (*halal*) and consumer demand (ASUH, probiotic and organic chicken products) that provide good models for biosecurity. For example in the consumer survey consumers rated *halal* certification as the most important characteristic and several schemes exist to certify RPAs. Farm biosecurity could adopt a similar system, independently certified by an organisation such as PBUI. The next strategic step may be to find ways to increase consumer demand such as education campaigns about biosecurity.

### **Product quality**

From the consumer perspective it is unclear if the concepts of biosecurity are well understood. A majority of stakeholders commented that a public education campaign was needed. Even if the concepts are well understood it is unlikely a product that looks inferior will sell, as was the case in South Sulawesi. The main problem in marketing the chicken in South Sulawesi was due to product appearance and this was related to existing packaging arrangements between the RPA and supermarket. The RPA was supplying normal chicken packaged in polystyrene trays and clear wrap. Therefore, the 'Healthy Farm' chicken was packaged in plastic bags which created a problem with product presentation (fluid visible in the bag) and failed to provide an improved appearance from normal chicken. This was the only supermarket that packaged normal unbranded chicken this way. So product appearance seems crucial whereas price seems less important. Supermarket officials gave examples of other premium products (such as organic and probiotic) that sold out when available at considerably higher prices than the healthy farm chicken. The supermarkets were enthusiastic about increasing the range of these products.

Product quality appears to be the main reason for the greater success of egg sales compared to meat. Several supermarket and egg suppliers said the healthy farm eggs were observably superior, having thicker shells and a yellower yolk. In fact this may be at least partly due to grading and washing of eggs rather than an overall increase in quality due to better health of chickens. Eggs were graded on size and washed by suppliers. In Sulawesi egg sales were decreasing for some time prior to the review team visit. The supermarket fresh produce manager attributed the decline to eggs not being washed and graded, i.e. a decline in product quality. The review team observed eggs that were varied in size and not washed on display in the supermarket, although when interviewed the egg supplier said she continued to grade and wash eggs.

Part of the problem in Bogor was related to perceptions of biosecurity. The concerns of the supermarket manager that awareness of biosecurity could impact normal or overall chicken sales has some validity. Sales have previously declined catastrophically after outbreaks. This attitude suggests customers have enough understanding of biosecurity to know it presents a danger to public health.

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## **7.10 The role of contracts in encouraging biosecurity investment**

Improving biosecurity and producing 'Healthy Farm' chicken has a number of potential benefits to the smallholder. These include: increased income due to higher productivity, reduced risk of disease incursion and an increased sale price. While it is difficult to objectively assess the effects of improved biosecurity, the following section does provide some insights into the ability of investments in biosecurity to reduce risk and receive a price

bonus. It discusses these with relation to six actual contract types presently being used by NICPS producers in Bali.

Contracts are designed to provide smallholders with access to quality and timely inputs plus a guaranteed minimum sale price. The benefit to the contactor is that they have some certainty in the supply of chicken meat to their customers. Generally there is a mutual benefit to both parties. Through the contract system smallholders receive two types of payments for their chickens; the agreed contract price and bonuses based on performance and actual sale price. It is through these bonuses that the smallholder can receive additional income and be encouraged to improve management and efficiency.

The following section discusses the role that contracts are playing in encouraging smallholders to improve their biosecurity. It uses smallholder data from two sources. Farm production and price data from a smallholder survey and biosecurity costs data elicited from the smallholders who are participating in the 'Healthy Farm' value chain and have implemented FBPs. It uses this data to construct models for each contract and undertake a gross margin analysis that compares the effects of increasing sale price due to selling 'Healthy Farm' chickens and the reduction in the risk of a major disease outbreak<sup>4</sup>. The contract conditions were provided by surveyed farmers. The section concludes with some discussion of the ability of contracts to encourage improved biosecurity in the NICPS in Indonesia. There are five types of bonuses that can be included in smallholder contracts.

1. The *market price bonus* is a percentage of the difference between the actual sale price and the agreed contract price. It is often linked to the performance of the cohort. The better the flock performance the greater the percentage of the higher price being passed on to the smallholder.
2. The *feed conversion ratio (FCR) bonus* reflects the smallholder's ability to use feed efficiently. Bonuses are paid with regard to the actual FCR attained by the smallholder compared to the standard FCR expected by the contractor.
3. The *European efficiency (EEF) or performance index (IP) bonus* is based on a number of factors including, mortality rate, average weight, FCR and age at harvest.
4. Each contract has a maximum mortality rate permitted, when the mortality rate is within the standard range a *mortality bonus* is awarded to the smallholders
5. A *production compensation bonus* accrues to smallholder when they are forced to keep their birds on-farm for longer than is efficient due to the companies being unable to pickup the birds when appropriate.

The bonuses included in the six contracts evaluated in this study are listed in Table 12. All the contracts provide some form of market price and FCR bonus although the conditions and magnitude may vary between contracts. Inclusion of the other bonuses vary between contracts.

**Table 12: Bonuses included in the six broiler contracts**

	FCR	Market price	EEF/IP	Mortality	Production
Contract 1	Yes	Yes			
Contract 2	Yes	Yes	Yes	Yes	
Contract 3	Yes	Yes			
Contract 4	Yes	Yes		Yes	
Contract 5	Yes	Yes		Yes	Yes
Contract 6	Yes	Yes		Yes	

<sup>4</sup> The farm survey data is for one cohort only and is then aggregated seven times to provide annual gross margin data. This may lead to some unrealistic estimates as costs and income will not be the same from one cohort to the next. The important issue is how the gross margin responds to changes in mortality rate, price rather than the actual changes in Rupiah.

The base scenario is provided in Table 13. This represents where there is no disease outbreak, no price premium on top of the existing market price bonus and no biosecurity investment. The market price bonuses play a vital part in providing income for farmers. In Contracts 4, 5 and 5 farm profit is mainly obtained from this bonus. Contract 1 and 2 do not pass on as high a percentage of price improvement as do the others. Contract 5 has both the highest gross margin pre-bonuses and the highest price bonuses. Contract 2 provides the greatest level of non-market price bonuses.

**Table 13: Base scenario - No disease outbreak, biosecurity investment or price premium (Rp.million)**

	Contract 1	Contract 2	Contract 3	Contract 4	Contract 5	Contract 6
Total income	1,003	1,174	1,087	1,110	1,072	1,167
Total costs	1,034	1,144	1,085	1,108	1,023	1,158
Bonuses						
Market price	14.2	10.0	45.9	32.5	50.3	21.9
Other	2.1	14.0	6.2	12.4	6.2	11.2
Total bonuses	16.3	24.0	52.1	44.9	56.5	33.1
<b>Total gross margin</b>	<b>-15</b>	<b>54</b>	<b>54</b>	<b>46</b>	<b>105</b>	<b>42</b>

An investment in biosecurity costs Rp.6.9million in Year 1 and Rp.2.25million in subsequent years. If there was no financial benefit in doing this (i.e. no price premium, no productivity increases and no disease challenge) this would represent, in 4 of the 6 contracts, a loss of approximately 20 percent of profit in Year 1; a significant cost.

The smallholders' perceptions of risk may play a role in the decision to invest in biosecurity. The risk averse may regard it is a useful form of insurance, while those with less experience of disease, or understanding of disease movement, may not wish to invest. Table 14 provides some guide as to the potential losses from a severe disease outbreak and, therefore, represents the risk that smallholders face with regard to diseases such as HPAI and Newcastle disease. The loss of one cohort out of the seven in the year has major implications for on-farm profitability, costing between Rp.34 (Contract 1) and Rp.53million (Contract 6). If smallholders lost a cohort every 2 years rather than every year they would lose half this amount.

**Table 14: Scenario 1 – Base scenario with a disease outbreak (lost 1 cohort) (Rp.million)**

	Contract 1	Contract 2	Contract 3	Contract 4	Contract 5	Contract 6
Total income	860	1,006	932	951	919	1,000
Total costs	922	1,012	973	990	908	1,039
Bonuses						
Market price	12.2	8.5	39.3	27.9	43.1	18.8
Other	1.7	14.3	5.3	10.6	5.3	9.6
Total bonuses	14.0	22.8	44.7	38.5	48.5	28.4
<b>Total gross margin</b>	<b>-49</b>	<b>7</b>	<b>3</b>	<b>-0.5</b>	<b>59</b>	<b>-11</b>

Apart from the reduction in risk, the ability of smallholders to supply to a premium market should also lead to financial rewards. An appropriate proportion of the benefit should return to the farmers. Scenario 2 (Table 15) considers the option that while there may be no disease outbreak, investing in biosecurity will allow the smallholder to participate in the 'Healthy Farm' value chain and the contract company receive a Rp.500/head market price bonus.

The flow of benefits to the smallholder under Contracts 1 and 2 are less than the investment required. These contract types do not encourage smallholders to invest in biosecurity through market price bonuses. Most of the benefits of smallholder investment accrue directly to the company. Contract companies 3, 5 and 6 have identical market price bonus systems and under these contracts farmers will cover the costs of their biosecurity investment, however, whether or not this is sufficient to encourage improved biosecurity is uncertain. More work is required in this area.

**Table 15: Scenario 2 – No disease outbreak, biosecurity investment and a premium (market price bonus) of Rp.500/chicken (Rp.million)**

	Contract 1	Contract 2	Contract 3	Contract 4	Contract 5	Contract 6
Total income	1,003	1,174	1,087	1,110	1,072	1,167
Total costs	1,034	1,144	1,085	1,108	1,023	1,158
Biosecurity costs	6.9	6.9	6.9	6.9	6.9	6.9
Bonuses						
'Healthy Farm' market price	2.1	5.0	10.6	8.3	10.6	10.6
Existing market price	14.2	10.0	45.9	32.5	50.3	21.9
Other	2.1	14.0	6.2	12.4	6.2	11.2
Total bonuses	18.4	29.0	62.7	53.2	67.1	43.7
<b>Total gross margin</b>	<b>-22</b>	<b>52</b>	<b>58</b>	<b>48</b>	<b>109</b>	<b>46</b>

## 7.11 Productivity benefits of biosecurity implementation

Regarding biosecurity implementation, farmers need to be convinced about the benefits of investing time and resources. In addition to economic benefit (premium price), productivity benefit is also concern for farmers. In contract farming, the productivity benefits are related to the bonuses farmers receive from the contract company. To investigate what benefits accrue via biosecurity investments, a study was conducted between May 2011 and November 2012 in Bali. There were 64 broiler farmers involved consisting of 32 approved biosecure farms and 32 non-approved farms. Most farmers (91%) were contract broiler farmers who had partnerships with MSJ, UJADI, Ciomas and PKP (Table 16).

**Table 16: Profile of sample farmers**

Description	Approved (no of farmers)	Percentage (%)	Non-approved (no of farmers)	Percentage (%)
Contract farmers:				
• MSJ	11	34	14	44
• UJADI	11	34	7	22
• Ciomas	4	13	4	13
• PKP	4	13	4	13
Independent farmers	3	9	3	9
Total	32	100	32	100

There are 5 indicators used to assess the performance of broiler farms, namely depletion, feed conversion ratio (FCR), weight of harvested bird, age of harvested bird and performance index (IP). The descriptive statistics are presented in Table 17 and the results of the analysis to evaluate the significance of the differences (t-test) are presented in Table 18.



**Table 17: Performance indicators for broiler farms in Bali**

Indicators	Approved farms		Non-Approved farms		All respondents	
	Mean	Std. deviation	Mean	Std. deviation	Mean	Std. deviation
Depletion (%)	4.68	2.11	5.76	2.72	5.22	2.47
FCR	1.70	0.08	1.76	0.11	1.73	0.10
Weight of harvested bird (kg)	1.73	0.16	1.75	0.17	1.74	0.17
Age of harvested bird (days)	33.6	2.29	34.3	2.03	34.0	2.17
Performance index (IP)	289	28.01	265	55.20	277	45.07

Similar results were found for the two groups with regard to FCR, weight and age of harvested birds. The body weight of birds at approved farms was 1.73 kg, slightly lower than the non-approved farms. This difference was probably due to non-approved farms tending to keep their birds for longer than the non-approved farms: 34.3 days compared to 33.6.

**Table 18: T-test for equality of means of performance indicators on broiler farms in Bali**

Indicators	Mean difference	t-value	p-value*	Decision
Depletion (%)	-1.083	-1.781	0.040	Reject Ho
FCR	-0.061	-2.487	0.008	Reject Ho
Weight of harvested bird (kg)	-0.022	-0.535	0.703	Do not reject Ho
Age of harvested bird (days)	-0.635	-1.174	0.123	Do not reject Ho
Performance index (IP)	23.978	2.191	0.017	Reject Ho

\*one-tailed test

The performance index (IP) of birds ranged from 198 to 386 with average of 277. The average of IP of approved farms (289) was higher than the non-approved (265).

The assessment of the benefit of biosecurity measures on broiler farms was conducted using t-test at 95 % confidence interval to verify whether there are productivity differences between the two groups.

Based on this analysis only depletion rate, FCR and performance index were significant. It indicates that adoption of biosecurity measures positively affects these three indicators. Birds coming from approved farms had lower depletion rate and FCR, and higher performance index than those from non-approved farms. The lower depletion rate can lead to an increase in farmers' gross income because more birds can be harvested.

## 7.12 Farmer of the Year Competitions

A 'Biosecure Farm of the Year' competition was considered to be a method of encouraging the adoption of biosecurity measures more widely within the communities. The competition was conducted in three provinces (Bali, South Sulawesi and West Java) over a period of four months (March - June, 2012). The objectives of the competition were to:

- Select farms that represent the best practice of the concepts of biosecurity in NICPS farms.
- Expose biosecurity and expand poultry farmers' knowledge of what their neighbours are doing and, therefore, what they can do.

- Provide an opportunity for the poultry industry to continue to develop linkages with government and poultry producers and develop consistent messages with regard to poultry biosecurity and general management.

### **Participants and competition procedures**

Information and applications were disseminated via contract companies and poultry associations. To enter the competition farms had to be smallscale with bird numbers ranging from 3,000 to 10,000. The participants were given a deadline of four weeks to complete and return the application (31<sup>st</sup> May 2012) which requested information and photos regarding their biosecurity practices. Support for advertising and prizes came from various institutions including the ACIAR project, the provincial governments, AusAID, Trobos magazine, farmer associations, DAFF and CP.

The competition received a total of 98 entries; 66 in Bali, 20 in South Sulawesi and 12 in West Java. The contract farmers came were spread over 10 companies in Bali, 3 in South Sulawesi and 6 in West Java.

The competition judges came from government, contract companies, universities, and private practice. There were 3 judges per province (Table 19). Being involved in the ACIAR farm accreditation process was the main consideration in the selection of judges. Thus, they had good skills and experience in evaluating biosecurity adoption of the farms.

**Table 19: Judges for the ‘Biosecure Farm of the Year’ competition**

Judges	Bali	South Sulawesi	West Java
Government	1	1	1
Contract company	1	-	-
University	1	1	1
Public veterinarian	-	1	-
Big poultry company	-	-	1

The first step in the process of selecting the finalists and farm winners was checking the completeness of the application documents (the farm profiles, check lists, and photos). It was followed by evaluating and scoring farms with regard to their farm profile and the biosecurity checklist.

There were 17 farmers who received high scores in Bali. To select 10 finalists, the judges visited the top 17 farms in order to confirm the application of biosecurity measures claimed in the application form. The judges selected six finalists in South Sulawesi and 5 finalists in West Java. They then visited the farms and interviewed the owners.

### **The winners**

Four farms won the competition in Bali, three of them were open house broiler farms and one was the best closed house. The award to the best closed house farm was intended to extend the ideas of biosecurity, and encourage farmers to adopt this management practice. The poultry industry encourages the application of closed systems in the future to improve production and management.

Ni Wayan Kartini was the overall winner in Bali. This independent broiler farmer had a good farm profile with sufficient signs. The farm had 4,000 birds with a good fence and was isolated from other farms. Every car entering the farm has to pass through a car/truck wheel-washing shed at the front gate. This farm also had good off-farm parking and a wash station in front of the second gate, where people can wash their hands and boots before entering the farms. A footbath was provided at every shed.

Biosecurity assessment during the competition in South Sulawesi resulted in a reasonable score with an average of 8 on a scale of 1 – 10. Three winners were selected based on their score. Lack of capital was cited as the major barrier limiting farmers' ability to implement biosecurity.

Sarjan was the overall winner in South Sulawesi. He raised 5,500 birds located far from the village and residential area in Tonasa II, Pangkep Regency. The farm had a complete fence around the boundary made from bamboo and netting. The gate was locked and no visitors were allowed to enter without permission. Before entering the farm, visitors have to clean their boots and hands with disinfectant.

The farm owned by Sanimin won first place in West Java. The farm is located at Cibinong, Kabupaten Bogor raising 5,500 birds. The farmer did not receive training directly from ACIAR project, but he has been supervised by Kaerudin who did participate in the ACIAR training. Sanimin also received mentoring from other international projects including CBAIC and SAFE. He built a cleaning station for workers to use before entering the shed, which encouraged them to change footwear and clothes, and wash their hands. It was only workers who could enter the shed. It had designated parking area for guests and trucks, signpost and footbath at the shed door.

The overall award ceremony for the winners in the three provinces was conducted in November 2012 during the ACIAR Project final workshop. However, stand-alone award ceremony was also conducted in Bali (25 June 2012) and South Sulawesi (26 June 2012) after the competition had been completed.

## **Conclusions**

The Farm of the Year competition (FoY) was an excellent activity to motivate farmers and contract companies to implement and improve biosecurity implementation at farm level. It is also a useful way to educate both farmers and contract companies on the benefits and costs of biosecurity adoption. By entering the competition, farmers could learn about the strengths and the weaknesses of their farm's biosecurity measures. This can bring a positive impact on the poultry industry in preventing disease outbreak and producing products from 'healthy' farms. The contract companies should encourage contract farmers to implement better biosecurity measures through the provision of price bonus to the farmers who achieve the highest IP or FCR for each harvest.

The FoY was conducted over a short time frame (four months) which was not enough for farmers to prepare and develop the application of biosecurity measures on their farms before judging. Longer time frame should be provided for farmer in the future competition.

As the competition brought about benefits in developing poultry industry, it should be conducted at national level by the government every year supported by the poultry magazine consortium (e.g Trobos, Poultry Indonesia, Infovet, Agrina), the big companies, poultry association and relevant institutions. This competition should also be extended to the layer farms.

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## 8 Impacts

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### 8.1 Scientific impacts – now and in 5 years

Risk analysis and economics have been a constant theme in the project and fundamental components of the biosecurity training. Farm biosecurity had not previously been given much thought in these terms, with generic biosecurity measures being poorly adopted and of questionable effectiveness.

The project has concentrated on understanding the drivers for adoption of biosecurity and encouraging NICPS producers to invest their resources in minimising the chances of poultry disease entering their farm. For the first time in Indonesia, smallholders have had reasons other than public good reasons, to control poultry disease. The project has shown that there are actual and potential on-farm benefits from improving biosecurity. These benefits are reduced risk of disease occurrence (catastrophic loss), productivity benefits (improved FRC and IP) and potentially better prices if a market is established that supports the marketing of products from approved farms.

A risk assessment was undertaken by Jenny-Ann Toribio and Debbie Eagles (Sydney University). They assessed the likelihood of HPAI introduction associated with human movement into broiler and layer farms in Bali and Sulsel. The research identified that the major risks in terms of people on small layer farms in Bali are manure and spent bird collectors, technical service providers (e.g. company or government advisors) and vaccinators. The most likely method for these visitors to introduce or spread disease is through footwear. Some conclusions were that risk management procedures targeting footwear will reduce likelihood of entry; for all people types; across all farm types and in all regions. Changing footwear will not reduce all risk associated with manure collectors on layer farms, vaccinators, technical service representatives and spent and live bird collectors. This understanding of method of disease risk was new for Indonesian producers and government and assisted the project develop recommendations with regard to access of value chain stakeholders on to and around the farm

For the first time this project developed a means of measuring the level of on-farm biosecurity through construction of the Biosecurity Score (BCS) and then identifying the characteristics of farms and farmers that were correlated and influenced adoption of biosecurity. The regression analysis identified that older more educated farmers with larger families are more likely to adopt better biosecurity in both layer and broiler farms. On layer farms, farmers with fewer non-poultry sources of income had better biosecurity.

The farm characteristic that influenced biosecurity adoption in both layer and broiler farms was land area of the farm. In broiler farms the number and average capacity of farms was also important. The analysis suggested that variables related to farm size had a positive impact on biosecurity control; the larger the farm the better the biosecurity. The distance of layer and broiler farms from neighbour's poultry and nearest road was also important; the greater the distance the better the biosecurity.

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### 8.2 Capacity impacts – now and in 5 years

Capacity development was a significant objective of the project and important when trying to ensure post-project sustainability. This has been in a number of forms and with a number of target groups.

*Surveying and data analysis:* Indonesian team members and partners have increased knowledge and experience of planning, conducting, analysing and reporting on surveys. A

greater degree of critical scientific thinking and more disciplined conduct of future surveys in which they are involved should result. There has also been a greater understanding of how risk analysis and economics can be applied to other areas of their work. For example, staff from UNUD, UNHAS and ICASEPS were involved in the *willingness-to-pay* surveys of consumers, and the extensive farm biosecurity surveys conducted in the three project locations. These surveys required planning, execution, analysis and report writing with input from Australian experts. These people and their institutions are stronger in these areas as a result.

*Research management and conference and journal paper presentations.* Staff and partners have been encouraged to take responsibility for their own research areas (e.g. Ni Putu Sarini and the productivity research). They have also received training in paper writing (e.g. through mentoring paper development for the June 2010, project funded conference) and presenting in conferences (both internal project workshops and industry and international).

*A process and protocol for advising on and implementing improved on-farm biosecurity.* There are now customised farm biosecurity plans underpinned by risk analysis and economics and requiring the assistance of trained advisors to develop and sustain them. This is a new concept for Indonesia that has gained great acceptance in project areas and by donors and government. This will lead to more widespread adoption of effective biosecurity and application of risk analysis and economics to other government and industry initiatives. There are now 9 Master Trainers approved to run the ACIAR/PBUI training courses and prepare farm biosecurity plans. Some of these people are already being employed in the public and private sectors to train farm advisors (e.g. Dewa Dharma with Provincial Department of Agriculture in Kalimantan and Ni Putu Sarini with Ciomas in Bali).

*Postgraduate training.* There have been 4 Masters programs supported by the project:

1. Drh Bugie Kurnianto: "Improving the competitiveness of 'Healthy Farm' products in West Java" at IPB.
2. Midha Karim has commenced a Masters Program through UNHAS. Her thesis is titled "Improving waste management from poultry slaughterhouses".
3. Putri Komaladara (UNUD, Bali) completed her PhD at UNE (supervised by Ian Patrick). Her thesis was titled 'Farm contracts and biosecurity: The case study of broiler farmers in Bali, Indonesia.
4. Debbie Eagles completed a Masters of Veterinary Epidemiology with Jenny-Ann Toribio at Sydney University supported by the project. Her thesis was titled 'A Qualitative Risk Assessment for the Entry of H5N1 Highly Pathogenic Avian Influenza onto Sector 3 Poultry Farms in Bali, Indonesia.'

*There were two study tours of Australia by Indonesians.* The three PPCs visited Australia from 12-18 August, 2012 during which time they attended the Crawford Fund Conference in Canberra, and visited ACIAR's Canberra Head Office and University of New England in Armidale where they each gave presentations to staff on development of the clean market chains in their provinces.

Six members of the Biosecurity Consultative Group visited Australia from 13-19 November, 2012 during which time they had meetings with staff from ACIAR and Animal Health Australia in Canberra, the Poultry Cooperative Research Centre and University of New England in Armidale, and the Australian Chicken Federation and the Australian Egg Corporation in Sydney. The tour was capped off by a visit to Sydney's Taronga Park Zoo.

The purpose of the trip to Australia is to allow them to learn about the way the poultry industry, government and farmers interact in Australia with regard to research, farmer relationships and marketing (market chain and market assurance). The participants were:

1. Ir Don Poerjono Utoyo (Head BCG, FMPI)
2. Dr Arief Daryanto (Director, MB-IPB)
3. Dr Desianto Utomo (International Partnership Director, CP)

4. drh Didin Sudiana (Manager, Industry and Government Liaison, PBUI)
5. drh. Ety Wuryaningsih (e: Animal Health & Veterinary Public Health, HPAI CMU, DGL&AHS)
6. Dr Dewa Dharma (Manager, Training & Management, PBUI)

*Training in biosecurity.* In terms of training a total of 613 value chain stakeholders received biosecurity training specific to their needs. Private and public advisors received a minimum of 4 days practical training in disease movement and risk mitigation and then had the option to develop their own training and auditing skills. Farmers had the opportunity to develop the same understanding and then participate in the CMC process which included developing a farm biosecurity plan, having their farm audited and then participating in the 'Healthy Farm' trial.

Provinces	Advisor	Farmers	Auditor	ToT	Stakeholder
Bali	35	178	16	15	15
Java Barat	61	67	11	15	18
Sulawesi Selatan	41	72	13	34	22
Total	137	317	40	64	55

The training program was useful in a number of ways, it;

- taught farmers about biosecurity and simple steps required to improve their productivity,
- provided a resource base for Master Trainers to run training programs for other donors and government agencies. The resources have been used by FAO, USDA, provincial Dinas Peternakan (via Dr Dewa Dharma) and the Indonesian Poultry Veterinarians Association (via Bugie Kurnianto), Ciomas Bali (via Ni Putu Sarini),
- provided an opportunity to develop training and workshop management skills within the project staff and Dinas staff,
- identified smallholders keen to be involved in further project activities, and
- assisted extension of biosecurity knowledge among farmers as neighbours learnt from project-trained farmers.

*Other.* Bugie Kurnianto Prasetyo was requested by the FMPI to act as the Biosecurity Advisor to assist with the implementation of Jakarta (DKI) Province Regulation No. 4, 2007' (Peraturan Daerah Provinsi Daerah Khusus Ibukota (DKI) Jakarta. No.4 Tahun 2007). The regulation will ban the slaughtering of poultry within the Jakarta City boundary and has immense implications on slaughtering, processing and transportation infrastructure in West Java.

Dr Dewa Dharma is the Biosecurity Advisor for Bali Zoo and Bali Elephant Park. He is also now the biosecurity expert utilised by DGLS to disseminate biosecurity skills and knowledge to provincial Dinas offices.

## 8.3 Community impacts – now and in 5 years

### 8.3.1 Economic impacts

Improving biosecurity and producing 'Healthy Farm' chicken has a number of potential benefits to the smallholder. These include: increased income due to higher productivity, reduced risk of disease incursion and an increased sale price. While it is difficult to objectively assess the effects of improved biosecurity, the project has provided some insights into the ability of investments in biosecurity to reduce risk and receive a price bonus.

Research was undertaken to assess the effects on livelihoods of investing in biosecurity. Based on the information gathered through the farm biosecurity plan process and analysing the bonus systems for 6 contracts in Bali, an investment in biosecurity costs Rp.6.9million in Year 1 and Rp.2.25million in subsequent years. If there was no financial benefit in doing this (i.e. no price premium, no productivity increases and no disease challenge) this would represent, in 4 of the 6 contracts, a loss of approximately 20 percent of profit in Year 1; a significant cost.

*Productivity:* Based on the analysis only depletion rate, FCR and performance index were significant. It indicates that adoption of biosecurity measures positively affects these three indicators. Birds coming from approved farms had lower depletion rate and FCR, and higher performance index than those from non-approved farms. The lower depletion rate can lead to an increase in farmers' gross income because more birds can be harvested.

*Premium price:* The ability of smallholders to supply to a premium market should lead to financial rewards. If smallholders invest, they should receive an appropriate proportion of the benefit. As an example, while there may be no disease outbreak, investing in biosecurity allows the smallholder to participate in the 'Healthy Farm' value chain and the contract company receive a Rp.500/head market price bonus. The flow of benefits to the smallholder under 2 of the contracts are still less than the investment required. These contract types do not encourage smallholders to invest in biosecurity through market price bonuses. Most of the benefits of smallholder investment accrue directly to the company. Under 3 of the contracts farmers will cover the costs of their biosecurity investment, however, whether or not this is sufficient to encourage improved biosecurity is uncertain.

*Risk of disease outbreak:* The smallholders' perceptions of risk may play a role in the decision to invest in biosecurity. The risk averse may regard it is a useful form of insurance, while those with less experience of disease, or understanding of disease movement, may not wish to invest. The loss of one cohort out of the seven in a year has major implications for on-farm profitability, costing between Rp.34 and Rp.53million (depending on the contract). If smallholders lost a cohort every 2 years rather than every year they would lose half this amount. An investment of Rp6.9million, as noted above may be a sound investment.

The conclusion from the project is that investing in biosecurity can have significant economic benefits in terms of productivity, risk reduction and potentially the ability to receive a higher price. The actual extent of this benefit depends on the nature of the contract and the ability of the contract to pass on an equitable proportion of the benefits.

### 8.3.2 Social impacts

Community level businesses including bankers, poultry shops, feed and vaccine companies are now aware of the benefits of improved biosecurity at farm level to their own business interests. These stakeholders will become important drivers of adoption of biosecurity by farmers.

Slaughterhouses participating in the clean market chain have recognised the important role they play in ensuring product integrity between farm and supermarket. It is expected that their involvement will take them to a higher standard of operation especially with hygiene.

Many NICPS farmers are implementing improved biosecurity practises and this is not limited to those who are participating in the project activities. Many non-project smallholders are talking to their neighbours and implementing changes based on these discussions. 'Over-the-fence' extension is proving useful as communities begin to understand the benefits of improving biosecurity.

Greater understanding of how contracts work and the different bonus systems offered by different companies may also empower smallholders to be more selective in the choice of contract partner. Smallholders are beginning to be less reliant on the company technical

advisors and with the use of signs, guestbooks and barriers are taking more control of who comes on to their farms and when.

Although it can't be stated that project activities have had any positive effect on disease incidence, it may be worth noting that while there have been outbreaks of HPAI in all the project provinces, there have been no outbreaks on project partner farms since the farms were approved.

There has been considerable interaction with other donors informally and at meetings, training courses and conferences organised by the ACIAR project. They have taken great interest in our approach to improving biosecurity and have made modifications to their approaches as a result. The modifications have been to increase interactivity of training, and have greater emphasis on risk management and identifying least cost options for improving biosecurity.

Improved poultry farm management with respect to biosecurity will be occurring in communities where project trained advisors and farmers live and work. Companies (e.g. Ciomas in Bali) have requested training for their advisors and are trying to encourage their contact farmers to improve biosecurity as they develop their own clean market chain.

### 8.3.3 Environmental impacts

The advantages from increased biosecurity are also advantageous to the environment for example if use of antibiotics, chemical disinfectants and the number of dead animals requiring disposal are reduced. However, evidence of these impacts occurring is not available.

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## 8.4 Communication and dissemination activities

*Project website:* All project reports are available at the project website, this includes, annual reports, monthly reports, travel reports as well as conference proceedings and other project reports.

[www.poultryhub.org/aciar-une-poultry-biosecurity-indonesia/aciar-une-poultry-biosecurity-indonesia/](http://www.poultryhub.org/aciar-une-poultry-biosecurity-indonesia/aciar-une-poultry-biosecurity-indonesia/).

*Farm of the Year:* The Biosecure Farm of the Year Competition was run in each of the three project locations. The winners were revealed in ceremonies in June 2012. Trobos, the largest national livestock magazine agreed to advertise the competition for free for three consecutive months May to June 2012. The competition created a lot of attention and interest. Sponsors, judges, Trobos, farmer associations, government and many other people have been involved. It has undoubtedly created widespread awareness of poultry farm biosecurity and the project.

*Pamphlets:* As well as the PBUI pamphlet explaining the role of the PBUI and the training program it manages, the project also produced a simple pamphlet to be used in conjunction with the training program. It provided a simple yet comprehensive explanation of poultry farm biosecurity in Bahasa (Appendix 17).

*Press and TV releases:* In Bali in June 2011 there was an article in the Bali Post newspaper on the projects attempts to improve poultry farm biosecurity in Bali and the sale of product from some of the projects biosecure farms at Carrefour Supermarket, Sunset Road, Badung, Bali. Around the same time, Ni Putu Sarini (PPC Bali) confidently appeared on Alam TV Bali (20 minutes) describing biosecurity implementation on farms in Selanbawak, Tabanan. The footage showed Sarini and the farmer inspecting biosecurity signs, boundary fencing, cleaning and disinfection of foot wear and washing hands before entering the poultry sheds.



Two articles have been published in the most important Indonesian poultry industry magazines; *Trobos* and *Poultry Indonesia*. These were reports based on the advisor training held in Bogor (Feb 2009) and more broadly on biosecurity in Sector 3 farms (Appendix 18).

*Videos*: Four videos have been produced that attempt to provide an overview of the project and some explanation of the CMC process.

- A project summary
- Summary of on-farm biosecurity
- Consumer information on the 'Healthy Farm' product for use in supermarkets, and
- A video specific for Suparwo's layer farm in South Sulawesi

Footage was used at the Crawford Conference in August 2012.

*Conference sponsorship*: The project sponsored the 'Towards the adoption of cost-effective biosecurity in NICPS farms' conference in June 2010. There were 9 individual papers being produced by team members and project partners. Papers are also being provided by CBAIC, FAO, IDP and USDA.

*Papers and journal articles*: See publication list

*Other*: Regular meetings and briefings were held with other donors. In particular with FAO, USAID, USDSA, and IDP. The project was always represented at the DGL&AHS poultry industry update meetings.

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## 9 Conclusions and recommendations

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### 9.1 Conclusions

The key conclusions from the project are:

1. *Improving biosecurity in smallholder poultry systems in Indonesia can have significant benefits to the farmer.* These benefits include a reduced risk of loss due to disease, improvements in on-farm productivity and efficiency indicators and higher prices for products if marketed appropriately.
2. *Consumers are, in theory and in practise, prepared to pay a premium price for a product produced on farms that have implemented approved biosecurity activities.* The consumer survey indicated that consumers would pay for products from 'approved' biosecure farms. This was supported by the trial of producing and selling 'Healthy Farm' meat and egg products in supermarkets in Bali and South Sulawesi. In Bali the premium price is on average 38% higher than regular chicken. Approximately 10% of chicken sales at the supermarket are 'Healthy Farm' chickens.
3. *Slaughterhouses are prepared to alter their procedures to support the production of niche chicken meat products.* The RPAs were prepared to pay more for broilers from approved farmers, implement improved hygiene practises and maintain product segregation if they were adequately compensated. The contract companies, RPAs and supermarkets were able to negotiate this by themselves. These stakeholders see the economic potential for the product and even after the completion of the ACIAR project the product continues to sell.
4. *The premium price benefits stop at the slaughterhouse.* They do not flow back to the farmer. The major reasons are lack of economies of scale and the nature of the contracts between the smallholder and the contract company.
5. *In order to provide advice on what smallholders need to do it is first necessary to be able to evaluate each farm's level of biosecurity.* The project constructed a method of measuring on-farm biosecurity. Every farm can be allocated a Biosecurity Control Score (BCS) which takes into account each farm's response to its specific risk.
6. *The project identified the potential factors that influence the adoption of biosecurity activities.* This project provided some practical guidelines as to the type of farm and farmer more likely to have higher levels of biosecurity. It provided a basis for selecting farmers who may be more likely to want to be involved in project activities (e.g. training and producing 'Healthy Farm' products) and some guidance as to the characteristics of farms and farmers that the project should encourage if hoping to improved adoption.
7. *The present contract system does not ensure that all the benefits from smallholder investment in biosecurity returns to the farm.* If farmers are to invest their own resources (e.g. labour and capital) in improving farm biosecurity, they have to have a contract system which adequately compensates them. At present farmers, through the existing bonus systems, only receive a proportion of the extra benefits. The contract companies receive the rest. Contracts vary in their ability to reward farmers.
8. *Contract companies play a significant role in influencing adoption of biosecurity activities.* It is possible for contract broiler farmers to receive the premium price if the potential contract company is willing to modify its conventional contract system.
9. *A training program is an essential and an integral part of a poultry biosecurity accreditation system.* Smallholders had poor understanding of how disease moves

onto and around the farm. Basic, practical training in biosecurity was enough for many smallholders to improve their farm management systems. Even without extra productivity or premium price benefits farmers were keen to adopt biosecurity as it reduced the risk of catastrophic loss.

10. *The training program must involve all stakeholders.* These including farmers, contractors, technical services, banks, feed and drug companies, government (local and central), poultry association, poultry shop, consumers etc. The current market structure (birds being sold without trace back or transparency into wet markets, live birds being purchased at these markets and being taken home) does not encourage disease control. The whole industry needs to be included in market development.
11. *The Farm of the Year competition (FoY) was an excellent activity to motivate farmers and contract companies to implement and improve biosecurity implementation at farm level.* It is also a useful way to educate both farmers and contract companies on the benefits and costs of biosecurity adoption.
12. *The project developed 3 protocols/SOPs to be used in the project and be considered for development and implementation by the DGL&AHS.* (1) All project staff followed the 'farm-visit' protocol developed by the project. (2) A set of minimum biosecurity standards for NICPS farmers was developed. It attempted to not be prescriptive but rather outline the farm conditions that need to be in place. (3) Although the slaughterhouses that the project worked with had, or were in the process of obtaining NKVs, the project also assisted with development of protocols and SOPs to ensure that products from project farms were treated separately and hygienically.
13. For the Indonesian poultry industry to continue to develop into an industry supplying safe, cheap and healthy poultry products it will need; institutional development (surveillance, product trace back, transparency in price movement, farm certification etc); improved access to better poultry products in the traditional markets and; contracts that encourage farmers to improve biosecurity.

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## 9.2 Recommendations

1. For the market to be able to reward and encourage smallholder broiler farmers to invest in biosecurity requires a greater percentage of a smallholder's cohort to be sold at a premium price. The 'Healthy Farm' trial has shown that while the new simplified market structure can work, there needs to be a market for farmer's cohorts rather than just a few hundred birds a month. As the infrastructure improves at traditional markets a trial which sells these products in these markets may more adequately test the economic viability of the process.
2. More work is also required to get a good understanding of how the supermarket sector in Indonesia, which includes large chains, small convenience stores and increasingly specialised chicken shops, can influence production. Retailers generally prefer to work with large consistent suppliers rather than many small commercial broiler producers. Supermarkets can exert both positive (through improving quality standards) and negative consequences (denying livelihoods to smaller producers). In addition to their upstream activities, they operate downstream, influencing product diversity and choice, food prices and consumer preferences. Related to this is the consumer preference for fresh products which is often in opposition to their desire to shop in supermarkets. More understanding of the unique Indonesian 'retailer revolution' is required.
3. Other characteristics need to be added to the product in order to make it more attractive to consumers. The demonstrated success of selling chicken meat in supermarkets at a price premium to non-project meat was based on the implication, accepted by customers, that the product was safer - less likely to contain infectious

agents of concern to public health - because of the more biosecure farming practices under which the birds had been raised. An extension of this work could consider the feasibility of a monitoring and evaluating the infection status of the farms over time, and also the microbiological status of the product at various sites and times along the value chain. The outcome would be a value chain confident that the whole process was delivering a safer, more acceptable product for which a price increment was worth paying.

4. Government and the national and provincial levels need to develop farm certification protocols to assist the market produce a safer processed product for consumers. At present the contract companies alone work with the smallholder producers to improve farm management practises. While there is increasing regulatory support given to the processing and retail sectors there is still no support to the NICPS. The national government should use an institution such as the PBUI to provide training and certification services. This would be regarded as an industry institution rather than a government one.
5. The Farmer of the Year competition brought about benefits in developing the poultry industry. It should be conducted annually at the national level by the government and supported by the industry and media (e.g. Trobos, Poultry Indonesia, Infovet, Agrina), the big companies, poultry association and relevant institutions. This competition should also be extended to the layer farms.
6. The poultry industry, while driven by the private sector, also needs to work closely with government to ensure issues such as food safety and certification of inputs and outputs are included in the policy discussion. National and provincial institutions such as the FMPI (and the BCG) and the PSCs could play a role in maintaining information flow and industry consultation.

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## 10 References

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### 10.1 List of publications produced by project

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#### Conference Papers

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## 11 Appendixes

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### Appendix 1: Biosecurity Consultative Group aims

#### Planning:

- Advise Ian Patrick (ACIAR project leader) on appropriate project activities to develop the development of industry policies and institutions that lead to adoption of biosecurity measures in the non-industrial commercial poultry sector (NICPS).
- Encourage the sustainable and on-going use and employment of the Poultry Biosecurity Centre in the poultry industry during and after the project.

#### Monitoring and Evaluation:

- Ensure project aims, objectives and activities are consistent with the objectives of the national poultry industry.
- Assist Ian Patrick with writing the Annual Report.

#### Management:

- Maximise communication and cooperation in the poultry industry with regard to adoption of appropriate biosecurity interventions.
- Develop linkages and funding opportunities with other potential donors to assist and add to project activities.
- Ensure integration of project activities with other international, national, provincial etc programs.
- As a subcommittee of the FMPI, report to FMPI on project activities and more generally on biosecurity in the poultry industry.

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## Appendix 2: Statements of Duties for PBUI Managers

### **POULTRY BIOSECURITY CENTRE MANAGER TRAINING AND POLICY DEVELOPMENT and MANAGER ADMINISTRATION AND LIAISON**

#### **Experience and qualifications**

- a) A veterinarian, graduated at least three years, with a sound knowledge of poultry production systems, diseases and principles of biosecurity.
- b) Knowledge of the poultry industry.
- c) Excellent English speaking skills and good English reading and writing skills.
- d) Excellent project management skills.
- e) Excellent organizational, data and information management skills.
- f) Able to work independently and without close supervision.
- g) Ability to solve complex logistical and administrative problems
- h) Ability to proactively liaise with and motivate stakeholders.

#### **PBUI MANAGER TRAINING AND POLICY DEVELOPMENT**

##### **Role and responsibilities**

- a) Work with Dr Tristan Jubb to deliver the objectives of the ACIAR project, particularly the training aspects.
- b) Organise and manage the training and policy development aspects of the project in Indonesia
- c) Manage and promote the PBC as the central coordinating unit for training and extension programs and the central repository for training and extension materials.
- d) Develop training and extension programs and materials (with Provincial Project Coordinators and others).
- e) Ensure consistent messages and methods are used in education and awareness programs in all provinces.
- f) Liaise with industry to develop sustainable processes to undertake farm audits and develop farm/community biosecurity plans.
- g) Liaise with government and industry to develop and implement minimum biosecurity standards and farm and product accreditation systems.
- h) Liaise with the project epidemiologist conducting qualitative risk assessment.
- i) Interpretation and translation of documents and presentations as required.
- j) Establish, maintain and seek new working relationships with relevant organisations and institutions that might assist the project.
- k) Represent the project at local and national forums as required by Ian Patrick.

#### **PBUI MANAGER ADMINISTRATION AND LIAISON**

##### **Role and responsibilities**

- a) Work closely with Dr Ian Patrick to deliver the objectives of the ACIAR project, particularly with regard to stakeholder liaison and project administration.
- b) Proactively liaise with and motivate all stakeholders and maintain effective stakeholder relations.
- c) Provide strategic advice to Ian Patrick on management issues involving industry and government stakeholders
- d) Liaise with industry to implement sustainable processes to undertake farm audits and develop farm/community biosecurity plans.
- e) Liaise with government and industry to develop and implement minimum biosecurity standards and farm and product accreditation systems.
- f) Manage project financial information and provide secretarial and liaison services.
- g) Provide detailed project reports including financial reports as scheduled which may require integrating information from a range of sources
- h) Organise meetings, workshops and travel involving the BCG.
- i) Act as the executive officer for the BCG.



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## **Appendix 3: Statements of Duties for Provincial Project Coordinators (PPCs)**

### **Qualifications, skills and experience**

- a) A poultry veterinarian or poultry production expert, graduated at least 3 years, with a sound knowledge of poultry production systems, diseases and principles of biosecurity.
- b) Knowledge of the poultry industry in and around the study locations (Makassar, Bogor or Bali).
- c) Excellent English speaking skills and good English reading and writing skills
- d) Good organizational and project management skills
- e) Good group communication and facilitation skills, particularly the ability to organize and run training courses and work with groups of farmers, veterinarians and animal health professionals of up to 30 people
- f) Able to work independently and without close supervision

### **Roles and responsibilities**

#### ***Project management***

- a) Develop and document project descriptions including for training courses
- b) Work under the direction of the ACIAR project leader or his delegate, and work with other members of the project team to deliver project outcomes
- c) Write reports, case studies and newsletters etc to document and promote project activities
- d) Organise workshops, discussion groups and training courses to deliver project outcomes
- e) Assist in the organization of farmer projects such as surveys
- f) Assist in the identification and implementation of on-farm research projects

#### ***Training and facilitation***

- a) Assist in the development of training tools and packages
- b) Organise and implement training programs
- c) Train farmers and animal health professionals
- d) Promote adoption of best-practice biosecurity within the poultry industry
- e) Facilitate information sharing and learning among small groups
- f) Assist trainees to develop biosecurity plans for farmers

#### ***Conduct field work***

- a) Assist in the collection and analysis of survey data
- b) Investigate disease events on commercial poultry farms under study
- c) Evaluate risk management strategies and conduct on-farm biosecurity audits

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## Appendix 4: Project Steering Committee aims

### Planning:

- Advise Ian Patrick (ACIAR project leader) on appropriate project activities to develop the adoption of biosecurity in the non-industrial commercial poultry sector (NICPS) in the Province.
- Assist Ian Patrick develop quarterly work plans for the Provincial Project Coordinators.
- Encourage the sustainable and on-going use and employment of the Provincial Project Coordinators in the poultry industry after project completion.

### Monitoring and Evaluation:

- Ensure project activities are consistent with project aims in the Province.
- Ensure project activities are consistent with needs of members' organisations.
- Assist Ian Patrick monitor and evaluate the performance and outputs of the Provincial Project Coordinators and the Project.
- Assist Ian Patrick with production of the Annual Report

### Management

- Develop linkages and funding opportunities with other potential donors to assist and add to project activities.
- Ensure integration of project activities with other international, national, provincial etc programs.
- Encourage integration of Provincial Project Coordinators into the poultry industry in the Province.
- Ensure appropriate dissemination of information, plans and outcomes.

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## Appendix 5: Sample PSC invitation and agenda

No. : 002/II/psc-jabar/2009                      Bogor, 9 Februari 2009  
Hal : Undangan Rapat  
Lampiran : 1 (satu) halaman

Kepada Yth.  
(Daftar Nama Terlampir)

**Di**

**Tempat**

Dengan hormat,

Dalam rangka pelaksanaan proyek ACIAR No. AH/2006/169 : *Cost-effective for Non-industrial Commercial Poultry Operation in Indonesia*, bersama ini kami mengundang Bapak/Ibu untuk hadir pada pertemuan yang akan diadakan pada :

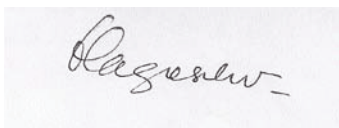
Hari / Tanggal : Rabu, 25 Februari 2008  
Waktu : 12.00 – Selesai WIB  
Tempat : Ruang Seminar Departemen AFF Lt.3 Wing 8  
Fakultas Kedokteran Hewan IPB  
Jl. Agathis Kampus IPB Darmaga  
Acara : Terlampir

Kami sangat mengharapkan kehadiran Bapak/Ibu dalam pertemuan diatas demi kelancaran pelaksanaan Proyek tersebut.

Atas perhatian dan kerjasamanya, kami mengucapkan terima kasih.

**Provincial Steering Committee – Jawa Barat**

**Ketua**



**Drh. Bambang Agus**

### Agenda Pertemuan

No.	Acara	Waktu	Pembicara
1	Registrasi , Makan siang	12.00 - 13.00	-
2	Pembukaan	13.00 - 13.10	Bambang Agus
3	Progress Report : Kinerja PPC	13.10 - 13.20	Bugie
4	Workplan PPC	13.20 - 13.30	Bugie/Hernomo
5	Evaluasi Program Pelatihan	13.30 - 13.40	Dharma/Tristan
6	Rencana Focus Group Discussion	13.40 - 13.50	Ian Patrick/Didin Suidiana
7	Survey Plan	13.50 - 14.00	ICASEPS
8	Diskusi	14.10 - 15.10	Peserta Rapat
9	Kesimpulan & penutup	15.15 - 15.30	Bambang Agus

### DAFTAR PESERTA dan UNDANGAN

1. drh. Bambang Agus (Ketua PSC)
2. drh. Hernomoadi Huminto, MVS (PPC Jabar)
3. drh. Bugie Kurnianto Prasetyo (PPC Jabar)
4. drh. H. Soetrisno, MM (Dinas Peternakan dan Perikanan Kabupaten Bogor)
5. drh. Herlien Krisnaningsih, MM (Dinas Pertanian Kota Bogor)
6. Desianto B Utomo, PhD (CP Representative)
7. drh. Ni Rai Fertilini (Hartono Farm Representative)
8. Dr.drh. Sri Murtini, MSi (FKH IPB)
9. drh. Titiek Legiwati (Dinas Peternakan Propinsi Jawa Barat)
10. drh. Didin Suidiana, MM (PBUI Manager – Industry Liaison and Project Management)
11. drh. Dewa M.N Dharma, MS, PhD. (PBUI Manager – Training and Policy Development)
12. Dr. Edi Basuno (ICASEPS)
13. Dr. Sri Hery Susilowati (ICASEPS)
14. Ir. Wahjuning K Sejati, MS (ICASEPS)

## Appendix 6: Outlines of stakeholder training workshops



Indonesian Poultry Biosecurity Centre



Australian Government

Australian Centre for  
International Agricultural Research

### **HOW TO CONDUCT A POULTRY FARM BIOSECURITY AUDIT** *A training program for animal health professionals*

#### **1. Introduction**

This is a two day training program for animal health professionals with responsibilities for auditing poultry farm biosecurity plans and their implementation. Satisfactory completion of this course is prerequisite to becoming a PBUI auditor and a PBUI Master Trainer. The program will give participants a short revision of farm biosecurity before launching into the details of how to conduct a biosecurity audit efficiently and effectively with positive outcomes for the farmer and biosecurity.

#### **2. Training method**

The training is interactive with participants working in small teams to share experiences and exercise their problem solving skills. There is an emphasis on the use of activities, case studies and team work to enhance learning. Class size is limited to 10 participants to maximise the practical learning experience. There will be a farm visit to apply the theoretical learning of the class room. Two experienced trainers/auditors will conduct the training.

#### **3. Learning outcomes**

By the end of the training program, the participants should be able to:

- Explain the PBUI biosecure farm accreditation system
- Use the biosecurity risk model as a basis for conducting audits
- Understand and assess farm biosecurity plans
- Conduct a farm walk to conduct a farm biosecurity assessment
- Make recommendations to a farmer and farm advisor on improving biosecurity
- Issue corrective action requests
- Describe the financial and other incentives to become a biosecurity auditor

#### **4. Assessment**

There will be an assessment for participants. The assessment will be based on the level of participation during group sessions, satisfactory completion of a participant's workbook and the results of a short test at the end of the training program. A certificate in *How to audit farm biosecurity* is awarded to participants completing the requirements of the training program.

#### **5. Further information**

Contact:

Dr Dewa Dharma  
Manager Training and Auditing  
Indonesian Poultry Biosecurity Centre  
Email: drdewadharm@gmail.com  
Mobile: 0813 3896 6955



**HOW TO IMPROVE BIOSECURITY ON YOUR POULTRY FARM**  
*A training program for poultry farm owners and managers*

**1. Introduction**

This is a two-day training program designed for owners and managers of commercial poultry farms. It aims to provide the key knowledge, skills and conceptual frameworks enabling farm owners and managers to confidently identify biosecurity risks to their poultry enterprises and control them. There is a strong emphasis on basic risk analysis and choosing and implementing practical and low cost but effective risk controls.

**2. Training method**

The training program runs for two days with 20 participants. Participants are provided with a Participant's Workbook and a Resource Manual for reference and guidance. The class room sessions are highly interactive with 4 working groups of 5 people each applying themselves to set tasks, some of them competitive, in scenarios using case studies and role plays interspersed with short presentations from the facilitator. White boards and flip charts are used to develop ideas and present findings. There are farm visits on day 2 which are used to show how to conduct a simple farm biosecurity risk assessment and develop a simple but effective biosecurity plan customised to the enterprise.

**3. Learning outcomes**

By the end of the training program, the participants should be able to:

- understand the positive benefits of biosecurity to their farm
- describe the important pathogens of poultry in Indonesia and how they spread
- list a range of control methods for important poultry pathogens and how and where they are applied
- perform a simple biosecurity risk analysis for their poultry farm
- develop a simple but cost-effective biosecurity risk management plan
- understand methods for implementing the plan in a sustained way

**4. Assessment**

There will be an assessment for participants. The assessment will be based on the level of participation during group sessions, satisfactory completion of a participant's workbook and the results of a short test at the end of the training program. A certificate in *Improving Biosecurity On Your Poultry Farm* is awarded to participants completing the requirements of the training program.

**5. Further information**

Contact:

Dr Dewa Dharma

Manager Training and Auditing

Indonesian Poultry Biosecurity Centre

Email: [drdewadharm@gmail.com](mailto:drdewadharm@gmail.com)

Mobile: 0813 3896 6955



## **HOW TO PREPARE A POULTRY BIOSECURITY RISK MANAGEMENT PLAN** *A training program for animal health professionals*

### **1. Introduction**

This is a five-day training program designed for government and private animal health professionals working in the poultry industries and with interest in and responsibilities for providing biosecurity advice to commercial poultry farmers. The training program aims to provide the key knowledge, skills and conceptual frameworks enabling participants to confidently and competently assist farmers to improve the biosecurity of the farmer's poultry enterprise. There is a strong emphasis on risk management planning.

### **2. Training method**

The training program runs for five days (including evening sessions) with 20 participants who are a mix of veterinarians and paraveterinarians to take advantage of a wide range of backgrounds and experience. Participants are provided with a Participant's Workbook, a Resource Manual and a CD containing presentations and handouts for reference and guidance. The class room sessions are highly interactive with 4 working groups of 5 people each applying themselves to set tasks, some of them competitive, in scenarios using case studies and role plays interspersed with short presentations from the facilitator. White boards and flip charts are used to develop ideas and present findings. There are farm visits on the mornings of days 2 and 4 where there is hands-on training in conducting a risk assessment and working with the farmer to develop a biosecurity plan.

### **3. Learning outcomes**

By the end of the training program, the participants should be able to:

- describe the important pathogens of poultry in Indonesia and how they spread
- decide on optimal methods of disinfection for important poultry pathogens
- determine the cost-benefits of biosecurity using a simple process
- perform a biosecurity risk analysis for a poultry farm
- develop a biosecurity risk management plan with a farmer
- market the positive benefits of biosecurity
- more confidently investigate disease events
- more confidently train professional colleagues in biosecurity risk management planning

### **4. Assessment**

There will be an assessment for participants. The assessment will be based on the level of participation during group sessions, satisfactory completion of a participant's workbook and the results of a short test at the end of the training program. A certificate in *Poultry Biosecurity Risk Management Planning* is awarded to participants completing the requirements of the training program.

### **5. Further information**

Contact:  
Dr Dewa Dharma  
Manager Training and Auditing  
Indonesian Poultry Biosecurity Centre  
Email: [drdewadharna@gmail.com](mailto:drdewadharna@gmail.com)  
Mobile: 0813 3896 6955

## Appendix 7: PBUI Biosecurity Training Brochure

### PELATIHAN UNTUK SIAPA?

PBUI telah mengembangkan suatu senarai pelatihan yang untuk untuk semua anggota industri perunggasan yang meliputi:

- ADVISOR:** Advisor swasta maupun publik, juga penyedia jasa serahkan dibutuhkan untuk menyediakan ahli teknis maupun manajemen kepada pelanggannya. Workshop ini menyediakan advisor dengan keterampilan dan pengalaman luas. **Durasi—4hari**
- TRAINER:** Agar pelatam tetap memiliki keuntungan dalam industri yang sedang berkembang mereka harus meningkatkan manajemen dan keuntungannya. Disesuaikan memiliki peran penting dalam pengembangan industri. **Durasi—2hari**
- AUDITOR:** Dalam pengembangan sistem biosekuriti industri unggas Indonesia peranan auditor sangatlah penting dalam langkahakreditasi. **Durasi—2hari**
- MANAJER/KEPERAWAT/KELOMPOK/PELAKU BANK, ASURANSI, PEMERINTAH PAKAN, PERUSAHAAN UBAH, Poultry shop, pemerintah harus memahami biosekuriti incusur unggas dengan baik agar bisa lebih berperan serta dalam membangun sistem. **Durasi—1hari****

### APA YANG SPESIAL TENTANG PELATIHAN PBUI?

**INTERAKTIF—LAMPUSAN!**

Dalam pelatihan ini disiapkan sos breakers, exercises dan activities yang trainer dan menambah semangat.

**WORKSHOP—KURSUS KAKI!**

Maksimal 20 peserta dengan minimum 2 pelatihan.

**MATERI YANG BERKAWAS!**

Manual Referensi dan Buku Kerja

**SEKUTIP!**

Selamat mengikuti pelatihan partisipan memperoleh sertifikat yang diandatangani oleh Master Trainer dan penyelenggara.

### KESEMPATAN MENJADI MASTER TRAINER

Partisipan yang telah menjadi sertifikat advisor dapat menjadi Master Trainer setelah melakukan 2 kali pelatihan biosekuriti di bawah supervisi Master Trainer dan menyusun "Rencana Manajemen Risiko Biosekuriti Industri Unggas"

#### HASIL PEMBELAJARAN

- Pelaku usaha industri peternakan termotivasi dan mampu mengimplementasikan / meningkatkan biosekuriti di tempat usahanya.
- Master trainer mampu menyelenggarakan pelatihan biosekuriti dengan baik.
- Advisor mampu menyusun rencana manajemen risiko biosekuriti industri unggas dengan baik.
- Auditor mampu melaksanakan audit biosekuriti industri unggas dengan baik.
- Peningkatkan keparipatrasidakerholder pogram tentang konsep-konsep dan prinsip-prinsip biosekuriti dan berkolaborasi untuk ke berbagai lokasi membangun sistem biosekuriti unggas Indonesia

**Dat. Dewa M N Dyawata MSc PhD**  
 Manajer Kelembuan dan Pengembangan Kebijakan  
**UMMAI BESAR VEKARINER DENPASAR**  
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**PELATIHAN  
BIOSEKURITI  
PETERNAKAN  
UNGGAS**



**Pusat Biosekuriti Unggas Indonesia**



**Australian Government  
International Agricultural Research**



# BIOSEKURITI MENINGKAT KEUNTUNGAN MENINGKAT

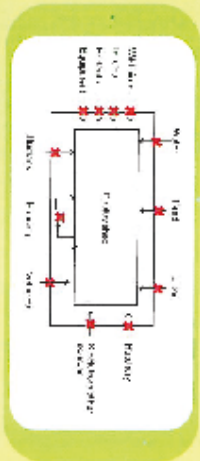
## PRNYAHILJUAN

Penahaman dan implementasi biosekuriti industri unggas di Indonesia masih sangat kurang terutama di peternakan sektor tiga dan empat juga di "post farm" seperti rumah pokong unggas, alat angkut, pasar unggas, toko daging unggas, pengumpul unggas dan poultry shop. Biosekuriti tidak hanya meliputi vaksinasi dan disinfeksi melainkan jauh lebih kompleks. Untuk dapat memahami dan mampu mengimplementasikan biosekuriti industri unggas secara komprehensif terutama dalam rangka menanggulangi awan influenza maka sangat perlu diadakan pelatihan "manajemen risiko biosekuriti Industri unggas" dengan teknik pelatihan interaktif yang mampu merubah pola pikir dan perilaku pelaku usaha untuk mewujudkan industri unggas yang biosecuritaman dari penyakit.



## APAKAH ITU BIOSEKURITI INDUSTRI UNGGAS?

Biosekuriti industri unggas adalah praktik manajemen untuk menekan masuknya penyakit ke industri unggas yang meliputi langkah-langkah biosekuriti dan dikendalikan.



## APAKAH MANFAAT BIOSEKURITI?

- meningkatkan produksi, produktivitas dan keuntungan
- meningkatkan kesejahteraan hewan
- mengurangi penggunaan obat
- mengurangi risiko bencana kematian dan kegagalan bisnis
- meningkatkan nilai pasar produk peternakan
- memudahkan memperoleh pinjaman finansial
- meningkatkan kepercayaan konsumen
- meningkatkan posisi tawar menyangkut isu dan kebijakan perdagangan global
- mencegah introduksi penyakit asing (eksotik)
- mengendalikan penyebaran infeksi dari suatu daerah ke daerah lain atau dari suatu peternakan ke peternakan lain.
- mencegah terjadinya zoonosis
- menghasilkan daging dan telur segar bebas patogen

## DIMANA DISELENGGARAKAN PELATIHAN?

Saat ini telah tersedia pelatih biosekuriti yang mempunyai kualitas di Jawa Barat, Bali dan Sulawesi Selatan. Pelatihan dapat diselenggarakan di mana saja di seluruh Indonesia

## SIAPA YANG MELATIH?

Pelatihan dilakukan oleh Master Trainer beresertifikat di bawah PBUI.

## SIAPA PENYANDANG DAN APELATIHAN INI?

Hubungi PBUI tentang biaya pelatihan terakhir untuk menyelenggarakan pelatihan di daerah Anda.



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**Appendix 8: Facilitator's Guide to Advisor Training**

# **Poultry farm biosecurity**

## **Risk management planning**

### **A training course for animal health advisors**

#### **Guide for organisers and facilitators**

**November 2008**

**Tristan Jubb  
Dewa Dharma**

## **Introduction**

This facilitator's guide is part of an integrated set of training materials developed for the course in biosecurity risk management planning. The aim of the course is to develop basic expertise among animal health advisors in the provision of biosecurity planning services to commercial poultry farmers in Indonesia.

The objectives of the course are:

1. To provide understanding and experience of biosecurity risk management
2. To provide training tools and materials
3. To describe strategies for promoting biosecurity among farmers and in communities

The integrated set of training materials includes (i) this facilitator's guide, (ii) a participant's workbook, (iii) a resource manual and (iv) presentation slides and handouts.

## **Learning strategies**

The biosecurity planner's course is designed to be led by a facilitator in a workshop situation. Learning strategies used throughout the training attempt to draw on the participant's own knowledge and experience in the poultry industry and involve group work, real and hypothetical case studies and role plays.

## **Assessment**

Participants will be assessed in four ways: (i) the degree of engagement in group and class exercises and activities, (ii) the satisfactory completion of the participant's workbook, (iii) the successful answering of questions in a written test post training (iv) the submission of a satisfactory biosecurity plan for a farm.

## **Course content and learning outcomes**

The topics covered in the course are as follows:

1. The nature of pathogens
2. Decontamination and disinfectants
3. The benefits of biosecurity
4. The cost-effectiveness of biosecurity
5. Principles of risk analysis
6. Risk management planning
7. Principles of biosecurity
8. Biosecurity risks for poultry farms
9. Biosecurity risk controls for poultry farms
10. Biosecurity planning for poultry farms
11. Investigating disease events
12. Quality assurance systems
13. Surveillance and alert systems
14. Promoting biosecurity planning

Sessions will usually begin with group exercises followed by group presentations, a facilitator’s presentation and class discussion. The individual exercises can be completed during the class discussions and facilitator’s presentations which will be facilitated to answer each of the questions.

Topic	Group exercises
1. The nature of pathogens	<ol style="list-style-type: none"> <li>1. List in rank order of importance, the pathogens of poultry in this region and identify which ones are harmful to humans</li> <li>2. List the sources of each pathogen and for each pathogen, how they might enter a farm</li> </ol>
2. The benefits of biosecurity	<ol style="list-style-type: none"> <li>1. List in rank order of importance the stakeholders in biosecurity on poultry farms,</li> <li>2. Explain using dot points (i) why they are stakeholders and (ii) the reason for their ranking</li> </ol>
3. Biosecurity risks for poultry farms	<ol style="list-style-type: none"> <li>1. List the biosecurity risks for a commercial poultry farm including their source and path of entry</li> <li>2. Group the risks in the list into different categories of risk</li> </ol>
4. Farm visit 1	<ol style="list-style-type: none"> <li>1. Ask the farmer questions allowing you to describe the people that move on and off the farm – who, when, where, how, how often, and why?</li> <li>2. Ask the farmer questions allowing you to describe the animals that reside on or move on and off the farm – what animals, when, where, how, how many and how often, and why?</li> <li>3. Ask the farmer questions allowing you to describe the equipment and vehicles that move on and off the farm – what, when, where, how, how much, how often, and why?</li> <li>4. Ask the farmer questions allowing you to describe the eggs, feed, water, manure and effluent that moves on and off the farm – what, when, where, how much, how often and why?</li> </ol>
5. Principles of risk analysis	<ol style="list-style-type: none"> <li>1. List 5 every day risks you face and the likelihood and consequences of them occurring               <ol style="list-style-type: none"> <li>a. Rank the risks in order of importance</li> <li>b. Against each risk, describe how you plan to prevent the risk from occurring</li> </ol> </li> </ol>
6. Risk management planning	<ol style="list-style-type: none"> <li>1. You are taking your family fishing at sea in your boat tomorrow. Prepare a risk management plan for this expedition</li> </ol>
7. Principles of biosecurity	<ol style="list-style-type: none"> <li>1. Draw a schematic or diagrammatical model of biosecurity for a commercial poultry farm</li> </ol>
8. The cost-effectiveness of biosecurity	<p>Groups 1 and 2</p> <ol style="list-style-type: none"> <li>1. List the income items for a typical layer farm and their amounts</li> <li>2. List the cost items for a typical layer farm and their amounts</li> <li>3. Determine the asset value of a typical layer farm</li> <li>4. List the biosecurity equipment and infrastructure changes required and their cost</li> <li>5. List the factors the farmer must consider in deciding how much money he/she can spend on biosecurity</li> </ol> <p>Groups 3 and 4</p> <ol style="list-style-type: none"> <li>1. List the income items for a typical broiler farm and their amounts</li> <li>2. List the cost items for a typical broiler farm and their amounts</li> <li>3. Determine the asset value of a typical broiler farm</li> <li>4. List the biosecurity equipment and infrastructure changes required and their cost</li> <li>5. List the factors the farmer must consider in deciding how much money he/she can spend on biosecurity</li> </ol>

Topic	Group exercises
9. Biosecurity risk controls for poultry farms	<ol style="list-style-type: none"> <li>1. Make a list the control measures for each risk identified in the session: <i>Biosecurity risks for poultry farms</i>, and the cost of each control measure</li> <li>2. List in rank order the six most expensive biosecurity risk controls and for each, explain how each might be achieved more cheaply</li> </ol>
10. Biosecurity planning for poultry farms	<ol style="list-style-type: none"> <li>1. Draw up a generic biosecurity risk management plan for a typical layer farm in this region</li> <li>2. Draw up a generic biosecurity risk management plan for a typical broiler farm in this region</li> </ol>
11. Decontamination and disinfectants	<ol style="list-style-type: none"> <li>1. List in rank order, the conditions in which pathogens will survive the longest</li> <li>2. List in rank order the disinfectant methods from most-effective to least-effective</li> </ol>
12. Investigating disease events	<ol style="list-style-type: none"> <li>1. List in rank order of importance, the records that a farmer should keep to help you investigate a disease event/biosecurity breakdown in his flock</li> </ol>
13. Disease surveillance and alerting systems	<ol style="list-style-type: none"> <li>1. List in rank order the reasons why farmers would keep knowledge of disease affecting their flock secret</li> <li>2. List the methods that might be used to encourage notification of disease</li> </ol>
14. Farm visit 2	<ol style="list-style-type: none"> <li>1. Using the auditing guidelines and checklists you have developed, perform a farm biosecurity audit and make a list of recommendations</li> <li>2. Ask the farmer what he thinks of the affordability and practicality of each of the recommendations and if he would implement some or all of them</li> </ol>
15. Biosecurity planning continued	Develop a biosecurity plan that you would present to the farmer visited for his consideration
16. Quality assurance systems	List in rank order of importance, the minimum biosecurity standards that you think should be adopted by all poultry farms in This region and the reasons for your choices
17. Promoting biosecurity planning	List the methods that can be used in This region to promote biosecurity planning in order of likelihood of success and explain the reasons for their ranking?
18. Action plans for step down training	

### Timetable

Day	Time	Duration	Session	Activities	Presenters
1	8.30-10.00	90min	Session 1	Opening ceremony Introductions Why we are here House keeping	Dewa Dharma
	10.00-10.15	15min	Morning tea	Morning tea	Morning tea
	10.15-12.00	105min	Session 2	The nature of pathogens	Dewa Dharma & Tristan Jubb
	12.00-13.00	60min	Lunch	Lunch	Lunch
	13.00-13.30	30min	Activity 1	Knot how to do it	Tristan Jubb
	13.30-15.00	90min	Session 3	Benefits of biosecurity	Dewa Dharma & Tristan Jubb

	15.00-15.15	15min	Afternoon tea	Afternoon tea	Afternoon tea
	15.15-17.00	105min	Session 4	Biosecurity risks for poultry farms	Tristan Jubb & Dewa Dharma
	17.00-19.30	150min	Break time & evening meal	Break time & evening meal	Break time & evening meal
	19.30-21.00	90min	Session 5	Biosecurity risks for poultry farms ctd.	Tristan Jubb & Dewa Dharma
2	8.30-10.00	90min	Session 6	Farm visit 1	Tristan Jubb & Dewa Dharma
	10.00-10.15	15min	Morning tea	Morning tea	Morning tea
	10.15-12.00	105min	Session 7	Farm visit 1	Tristan Jubb & Dewa Dharma
	12.00-13.00	60min	Lunch	Lunch	Lunch
	13.00-13.30	30min	Activity 2	Personal biosecurity demo	Tristan Jubb & Dewa Dharma
	13.30-15.00	90min	Session 8	Principles of risk analysis and risk management planning	Tristan Jubb & Dewa Dharma
	15.00-15.15	15min	Afternoon tea	Afternoon tea	Afternoon tea
	15.15-17.00	105min	Session 9	Principles of biosecurity	Tristan Jubb & Dewa Dharma
	17.00-19.30	150min		Break time & evening meal	Break time & evening meal
	19.30-21.00	90min	Session 10	Cost-effectiveness of biosecurity	Tristan Jubb & Dewa Dharma
	3	8.30-10.00	90min	Session 11	Biosecurity risk controls for poultry farms
10.00-10.15		15min	Morning tea	Morning tea	Morning tea
10.15-12.00		105min	Session 12	Biosecurity planning for poultry farms	Tristan Jubb & Dewa Dharma
12.00-13.00		60min	Lunch	Lunch	Lunch
13.00-13.30		30min	Activity 3	Balls and buckets	Tristan Jubb
13.30-15.00		90min	Session 13	Decontamination and disinfectants	Dewa Dharma & Tristan Jubb
15.00-15.15		15min	Afternoon tea	Afternoon tea	Afternoon tea
15.15-17.00		105min	Session 14	Investigating disease events	Tristan Jubb & Dewa Dharma
17.00-19.30		150min	Break time & evening meal	Break time & evening meal	Break time & evening meal
19.30-21.00		90min	Session 15	Disease surveillance and alert systems	Tristan Jubb & Dewa Dharma
4	8.30-10.00	90min	Session 16	Farm visit	Tristan Jubb & Dewa Dharma

	10.00-10.15	15min	Morning tea	Morning tea	Morning tea
	10.15-12.00	105min	Session 17	Farm visit ctd.	Tristan Jubb & Dewa Dharma
	12.00-13.00	60min	Lunch	Lunch	Lunch
	13.00-13.30	30min	Activity 4	Moving chairs	Tristan Jubb
	13.30-15.00	90min	Session 18	Biosecurity planning ctd.	Tristan Jubb & Dewa Dharma
	15.00-15.15	15min	Afternoon tea	Afternoon tea	Afternoon tea
	15.15-17.00	105min	Session 19	Biosecurity planning ctd.	Tristan Jubb & Dewa Dharma
	17.00-19.30	150min	Break time & evening meal	Break time & evening meal	Break time & evening meal
	19.30-21.00	90min	Session 20	Biosecurity planning ctd.	Tristan Jubb & Dewa Dharma
5	8.30-10.00	90min	Session 21	Quality assurance systems and promoting biosecurity planning	Tristan Jubb & Dewa Dharma
	10.00-10.15	15min	Morning tea	Morning tea	Morning tea
	10.15-12.00	105min	Session 22	Action plans for step down training	Dewa Dharma & Tristan Jubb
	12.00-13.00	60min	Lunch	Lunch	Lunch
	13.00-13.30	30min	Session 23	Action plans for step down training ctd.	Dewa Dharma & Tristan Jubb
	13.30-15.00	90min	Session 24	Post test, course critique	Dewa Dharma
	15.00-15.15	15min	Afternoon tea	Afternoon tea	Afternoon tea
	15.15-17.00	105min	Session 25	Closing ceremony, certificate presentation	Dewa Dharma

## Activities

Contact Tristan Jubb for information re appropriate activities

## Course administration

- A course preparation and conduct checklist is provided as Form 1.
- A proposed class room layout is shown
- A form to collect contact details of participants is provided as Form 2.
- A course evaluation questionnaire is provided as Form 3.
- A checklist for the Welcome and Introduction to the workshop is provided in section 7.4

**Form 1: Checklist for training course preparation and conduct**

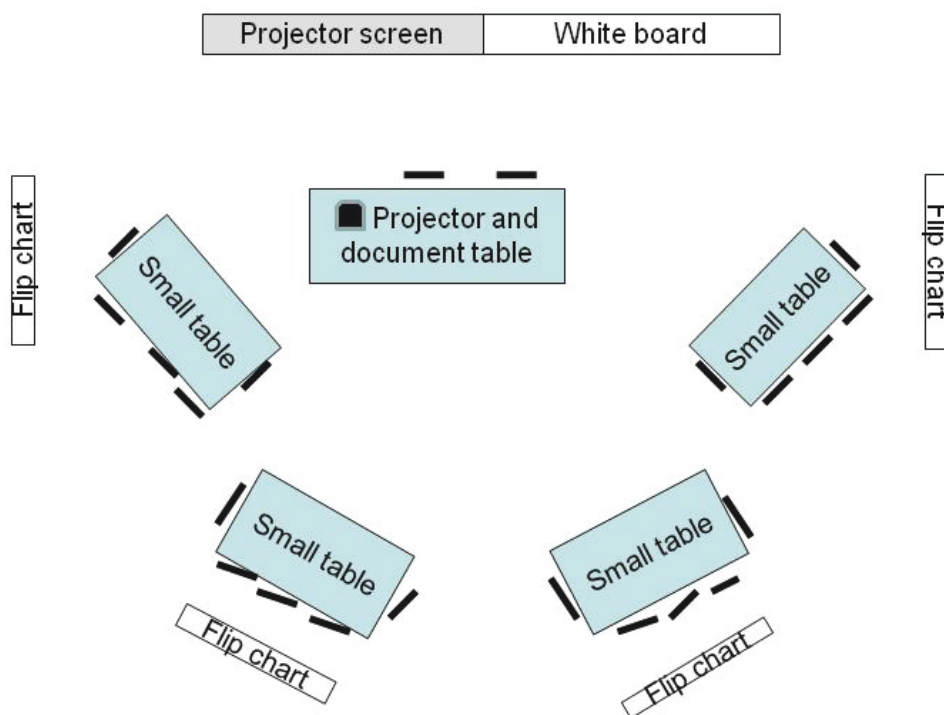
<b>Choice of venue</b>	Person responsible	Tick when checked
Is the venue clean, well maintained and with functioning air conditioners?		
Is there capacity for least 20 participants seated at tables in comfort?		
Can tables and chairs be moved safely by two people?		
Are the tables and chairs of sound construction, in good condition and comfortable?		
Does the venue supply whiteboard, markers and eraser + flip chart stands for butcher's paper?		
Are there sufficient tables or space for group activities?		
Wall for the display of worksheets/ butchers paper (must be able to use blu-tack)?		
Is there a table located at front of workshop space for you to use?		
Can the venue provide catering services or will you need to arrange or provide this?		
Will there be any staff available at the venue to assist in the event of a problem?		
Access and parking for participants/facilitators, including those with limited mobility? Any costs?		
Is there a break out area for refreshment breaks (could be outdoors, another room or even an eatery etc.) with tea and coffee making facilities?		
Venue opening and closing times?		
What are the security access requirements?		
Are toilets accessible to participants/facilitators including those with limited mobility and located in close proximity to the workshop space?		
Does the venue comply with fire safety regulations?		
Are there any loose electrical cords or exposed wiring?		
Can any extension leads be roof mounted or taped to the floor)?		

<b>Before the course</b>	Person responsible	Tick when checked
<b>Pre-course administration</b>		
Record of approval to conduct activity (signed contract)		
Confirmation of availability (venue, trainers, translators, staff, equipment etc)		
Confirm availability of all resources (including travel, accommodation, catering, venue, staff, equipment, finances)		
Prepare course program including dates, times, training staff		
<b>Identify participants</b>		
Promote the training course to attract participants		
Obtain participant contact details, including area of expertise, enterprise managed		
Joining instructions issued to participants		
<b>Book venue and catering</b>		
Book venue		
Advise or arrange catering requirements, noting: <ul style="list-style-type: none"> <li>• times for morning/afternoon tea, lunch, and whether tea and coffee are required on arrival</li> <li>• any delivery requirements or restrictions for catering staff to enter venue</li> <li>• dietary requirements</li> <li>• phone contacts for both you and the caterer in case of difficulties</li> </ul>		
<b>Prepare handbook</b>		
Prepare handbook and customise if required based on feedback from training team. Does the handbook need translating?		
Select or develop appropriate exercises and activities for the groups of participants		
Print and post out handbooks to participants at least a week before the course		



<b>Before the course, check the following:</b>	Person responsible	Tick when checked
Lap top, data projector, spare globe and screen		
Extension cord and power board		
Tape or mat to cover power cord to prevent trip hazard		
Spare pens (biros), marker pens and whiteboard markers		
Butchers paper		
Name tags and cards		
Participant contact details. Phone contacts for the catering and venue		
Copies of: <ul style="list-style-type: none"> <li>• Timetable, exercises and activities</li> <li>• Disease fact sheets</li> <li>• Risk management templates</li> <li>• Participant contact details (blank form)</li> <li>• Course evaluation forms</li> </ul>		
Props for activities: Flour talk: Disposable <u>white</u> coveralls with hood and booties x 1, chair, table, pencil, pens, magazine, flour, <u>black</u> smocks x 3 Balls and buckets: Waste A4-size paper for scrunching into paper balls, chairs x 3, open area in room with 9 m throwing distance available, small waste paper baskets (20cm diam) x 3, large bins (40cm diam) x 3. Moving chairs: Large area in a room with no tables but chairs for each participant, paper with instructions, paper for signs Biosecurity demonstration: Bucket, brush, spray bottles, dishwashing detergent, plastic drop sheet 1m x 1m, plastic goggles, mobile phones, small sealable plastic bags for phones, large plastic disposal bags, disposable coveralls, gloves, masks, booties		
<b>At the venue check the following;</b>		
The venue is safe. For example are there hazards on which a person could trip or slip? Are there chemical hazards, electrical hazards or, unacceptable noise levels?		
Venue is clean		
Venue is comfortable for participants (heating, cooling, lighting)		
Toilets are unlocked, clean with plentiful paper		
Layout is as requested and suitable for the number of participants		
Location of power point. Screen and video are suitable		
How to summon help in an emergency		
Emergency exits, emergency procedures, a first aid kit is available		
Tea, coffee, lunches are ordered and food service area is clean and accessible		
<b>After the course</b>		
Activity evaluation responses		
Validation recommendation		
Financial report		
Activity report (including assessment records)		
Follow up letters		

### Proposed class room layout



### Form 2: Participant's contact details

Name	Position	Organisation	Address	Postal address	Phone	Mobile	Email
1.							
2.							
3.							
4.							
5.							
6.							

**Form 3: Training course evaluation questionnaire**

**Now that you have participated in the Poultry Farm Biosecurity Risk Management Training course could you please reflect on the effectiveness of the training?  
Please circle the number in the right hand columns that best reflects your answer.**

**Before the training course**

	Agree	Undecided	Disagree	Not applicable
1. I found the pre course instructions clear.	3	2	1	0
2. The training provider tried to accommodate my needs.	3	2	1	0
3. I felt that I could contact the training provider to clarify my arrangements at any time.	3	2	1	0
4. I knew what to expect.	3	2	1	0
5. I had an overview of what would be in the training course.	3	2	1	0

Any comments on the **pre training course instructions and your expectations of the training course?**

.....  
 .....  
 .....

**Accommodation and meals**

1. My accommodation was comfortable.	3	2	1	0
2. My accommodation was satisfactory.	3	2	1	0
3. The food catered for my dietary requirements.	3	2	1	0
4. During the training course I had enough to eat.	3	2	1	0

Any comments on your **accommodation and meals?**

.....  
 .....  
 .....

	Agree	Undecided	Disagree	Not applicable
<b><u>Training course content</u></b>				
1. There was <b>too much</b> in this training course to cover without rushing.	3	2	1	0
2. Most of the content of this training course seemed relevant to me.	3	2	1	0
3. I will be able to use what I learned in the future.	3	2	1	0
4. The training course was at the right level for me.	3	2	1	0

Any comments on the **training course content**?

.....  
 .....  
 .....

**Training course delivery**

1. The balance between the amount of listening time and hands on activity was OK.	3	2	1	0
2. The activities during the training course added to my learning.	3	2	1	0
3. I was able to fully participate in the activities.	3	2	1	0
4. The delivery of this training course was well organised.	3	2	1	0
5. The delivery approach was thought provoking.	3	2	1	0
6. The presenters were enthusiastic about the topic.	3	2	1	0
7. This training course has increased my understanding about biosecurity risk management for poultry farms.	3	2	1	0
8. I would recommend the presenters to others.	3	2	1	0

Any comments on the **training course delivery**?

.....  
 .....  
 .....

	Agree	Undecided	Disagree	Not applicable
<b><u>Participants' needs</u></b>				
1. This training course met my needs.	3	2	1	0
2. The presenters responded well to my needs.	3	2	1	0
3. I needed more background information before attending this training course.	3	2	1	0
4. The environment <b>was not</b> conducive to learning.	3	2	1	0
5. I would recommend this training course to others.	3	2	1	0

Any comments on **participants' needs**?

.....  
 .....  
 .....

The **best thing** about this training course was:

.....  
 .....  
 .....

The **worst thing** about this training course was:

.....  
 .....  
 .....

Things about the training course I would **change** are:

.....  
 .....  
 .....

Any other comments?

.....  
 .....  
 .....

**THANK YOU FOR YOUR COOPERATION!**

## **Checklist for Introduction and Welcome**

### ***Introductions***

- Introduce yourself and tell the participants your background and role
- Have everyone in turn state their name, organization and position
- Toss a ball around such that anyone catching it discloses ONE fact about themselves, ensuring everyone has a turn

### ***Ground rules***

- Mobile phones are off
- Everyone to attend on time
- One person speaks at a time
- The workshop is interactive so everyone is to participate

### ***Housekeeping***

- Toilets
- Tea and coffee
- Meals

### ***Workshop outline***

- Describe the training aims and objectives and the qualification that will be attained
- Provide an outline of the course including session content, learning strategies, activities and field visits
- Describe the assessment process which will include review of level of engagement, the participant's hand book and completion of hypothetical and real biosecurity plans

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## Appendix 9: PBUI 'How to Train' Workshop Outline

Bagaimana Menyelenggarakan Pelatihan yang Baik  
Bali, 10 November 2009, Bogor, 12 November 2009  
Program Pelatihan untuk Professional Kesehatan Hewan  
Deskripsi Program  
Tristan Jubb BVSc MVS PhD, Dewa Dharma DVM MsC PhD

### BAGAIMANA MENYELENGGARAKAN PELATIHAN YANG BAIK – DESKRIPSI PROGRAM

#### 1. Pendahuluan

Ini adalah program pelatihan satu hari untuk para profesional kesehatan hewan yang bertanggung jawab untuk mengorganisir dan menyelenggarakan kursus pelatihan. Program ini akan memberikan kepada partisipan pengetahuan yang baik tentang metode pelatihan agar kursus pelatihan berjalan dengan lancar dan memberikan hasil pembelajaran yang positif.

#### 2. Metode Pelatihan

Pelatihan ini bersifat interaktif di mana partisipan bekerja dalam tim kecil untuk berbagi pengalaman, mengembangkan ide –ide dan berlatih keterampilan memecahkan masalah. Ada juga penekanan dalam penggunaan aktifitas, permainan, studi kasus dan kerjasama tim untuk meningkatkan hasil pembelajaran. Untuk pelatihan ini lebih disukai kelas kecil terdiri dari 15 orang dan ini akan dibagi menjadi tiga tim kecil. Untuk mengembangkan ide – ide dan mempresentasikan hasil diskusi dipergunakan *white board* dan *flip chart*. Sedangkan fasilitator akan memberikan presentasi singkat dan demonstrasi.

#### 3. Hasil Pembelajaran

Pada akhir program pelatihan, partisipan mampu :

- menyelenggarakan kursus pelatihan
- memahami faktor faktor yang mempengaruhi keberhasilan atau kegagalan penyelenggaraan pelatihan dan bagaimana mengatasinya
- memahami prinsip - prinsip pembelajaran orang dewasa dan bagaimana mengimplementasikannya
- menilai partisipan dan mengevaluasi pelaksanaan pelatihan
- mendorong keikutsertaan dan agar partisipan tetap mengikuti pelatihan hingga akhir masa pelatihan
- bagaimana menangani partisipan untuk meningkatkan pembelajaran dan partisipasi dan menangani partisipan yang bermasalah
- menggunakan berbagai teknik seperti *ice breakers*, *energizers*, dan aktivitas untuk meningkatkan pembelajaran dan mempertahankan kesiagaan dan konsentrasi partisipan
- menyiapkan tata ruang yang tepat serta semua peralatan untuk pelatihan
- bagaimana mengelola keterbatasan waktu secara efektif
- menggunakan berbagai teknik peningkatan pelatihan yang tersedia dalam presentasi dengan Microsoft PowerPoint
- bagaimana mempersiapkan dan mempresentasikan sertifikat dan hadiah, dan juga upacara pembukaan/penutupan kursus pelatihan

#### 4. Penilaian

Partisipan akan dinilai pada akhir pelatihan. Penilaian didasarkan pada tingkat partisipasi peserta pada sesi kelompok, penyelesaian buku kerja peserta yang memuaskan dan hasil ujian (post test) pada akhir program pelatihan. Sertifikat "*How to run a training course* " diberikan kepada partisipan yang dapat menyelesaikan semua persyaratan program pelatihan. Contoh sertifikat tersedia di bawah ini.

Jadwal Waktu	Durasi (menit)	Sesi	Topik
08.45	15	Pembukaan	Ucapan selamat datang dan perkenalan Kerumahtanggaan Tujuan pelatihan Pembagian tim
09.00	50	Memaksimalkan pengalaman berlatih	Pelatihan orang dewasa Formula pertunjukan permainan Memperoleh kesesuaian dengan tata tertib
09.50	40	Berinteraksi dengan audien	Presentasi diri Mengembangkan gaya/style Memposisikan diri Bertanya dan menjawab pertanyaan
10.30	15	Jeda kopi pagi	Jeda kopi pagi
10.45	55	Tim dan kerjasama tim	Tim dan ukuran kelas Pembagian tim Kerjasama tim Presentasi tim Presentasi jawaban yang benar
11.40	50	Menangani partisipan nakal	Menghindari munculnya partisipan nakal SPRQing
12.30	30	Ishoma	Ishoma
13.00	30	Menggunakan PowerPoint	Kapan saatnya menggunakan PowerPoint Bagaimana menggunakan PowerPoint Bagaimana menggunakan alat PowerPoint
13.30	30	Mengelola waktu	Perencanaan Selama dalam pelatihan
14.00	30	Mengelola rasa ngantuk	Rencana menghindari ngantuk Stimulan
14.30	30	Spesifikasi ruang pelatihan	Peralatan Tata ruang
15.00	15	Jeda kopi siang	Jeda kopi siang
15.15	30	Aktifitas	Ice breakers Energisers Learning activities
15.45	30	Menilai partisipan	Partisipasi, buku kerja dan ujian Pretests dan post tests Buku kerja partisipan Penilaian pasca pelatihan
16.15	30	Evaluasi pelatihan	Rancangan form evaluasi
16.45	15	Penutupan	Upacara penutupan Pembagian sertifikat Foto kelas
17.00	Akhir pelatihan	Akhir pelatihan	Akhir pelatihan



## Appendix 10: Constructing the Biosecurity Control Score

Description of the biosecurity risk variables and categories used to score and compare poultry farms in Bali and West Java

Risk factor	Level of biosecurity		
	<i>Low</i>	<i>Medium</i>	<i>High</i>
<b>1. Farm inputs</b>			
1A. Type of poultry feed	Home produced feed Home produced feed & commercial pellets All types of feed	Purchased grain Purchased grain & commercial pellets	Commercial feed (pellets only)
1B. Source of concentrate	Spot market Another farmer	Poultry shop	Contractor company Direct from feed company
1C. Source of poultry feed	Another farmer	Poultry shop	Contractor company Direct from feed company Spot market
1D. Source of supplements	Spot market Another farmer Don't know	Poultry shop Don't purchase	Contractor company Direct from feed company Direct from drug company
1E. Source of litter	Spot market Another farmer Don't know	Poultry shop Rice mill Don't purchase	Contractor company
1F. Assurance that DOC were healthy and safe	Own knowledge Don't know	Trust supplier	Government certificate Supplier certificate
1G. Source of water for the shed	Rain River/dam	Well Spring	Town water (PDAM)
1H Poultry drinking water chlorinated	No, don't know	Sometimes	Yes
II Staff ownership of birds at home	Yes Some Probably Don't know		No
<b>2. Traffic onto the farm</b>			

Risk factor	Level of biosecurity		
	Low	Medium	High
2A Number of household members	>=7	4,5,6	<=3
2B Number of household members working on the farm	<=1.2	1.2-2	>=2
2C Non-broiler income from all sources	>Rp.6m	Rp.0-6m	Rp.0
2D Number of sources of non-poultry income	>2	1-2	0
2E Permission for collector to enter farm	Contract company Technical support Dinas Poultry shop Collectors No decision		Owner Manager Owner + manager Manager suggest owner decides
2F Permission for Dinas to enter farm			
2G Permission for relative of labourer to enter farm			
<b>3. Distance from shed to sources of risk</b>			
3A Distance from house to farm	<100m	100-300m	>300m
3B Distance to nearest road	<3m	3-10m	>10m
3C Distance to nearest water source	<30m	30-100m	>100m
3D Distance to nearest live bird market	<0.5km	0.5-1km	>1km
3E Distance to nearest house	<3m	3-30m	>30m
3F Distance to nearest paddy field	<3m	3-10m	>10m
3G Distance to neighbours poultry shed	<30m	30-100m	>100m
3H Distance to nearest garden	<0.3m	0.3-3m	>3m
3I Distance to nearest feed storage	<3m	3-10m	>10m
3J Distance to the office	<3m	3-10m	>10m
3K Distance to the car park	<3m	3-10m	>10m
3L Distance to boundary fence	<3m	3-10m	>10m
<b>4. Vulnerability of farm given its size and location</b>			
4A Dry land owned	>0.8ha	0-0.8ha	0ha
4B Irrigated land owned	>0.8ha	0-0.8ha	0ha
4C Chickens owned	>20	0-20	0
4D Duck owned	>20	0-20	0
4E Number of sheds	>4 sheds	2 or 3 sheds	1 shed
4F Land area owned	>2200sqm	500-2200sqm	<500sqm

Risk factor	Level of biosecurity		
	Low	Medium	High
4G Total bird capacity	>8,000 birds	4,000-8,000 birds	<4,000 birds
4H Farm located higher or lower than surrounding areas	Lower	Same height	Higher
4I Number of commercial farms within 1 km	>13	3-13	<3
<b>5. Level of biosecurity at farm gate</b>			
5A Fences and locks	No secure boundary fence No locks on gates	2 rankings between these low and high options	Secure boundary fences Locks on all gates Gates locked at all times
5B Number of entrances	>3	2	1
5C Parking and vehicle washing	No parking area No car wash area No high pressure pump	5 rankings between these low and high options	Dedicated parking area Car wash for all vehicles entering farm High pressure pump spray
5D Signs around perimeter	No signs	2 rankings between these low and high options	High number of signs per farm area Sign instructing report to office
5E Footbaths at farm gates	No footbath at farm entry	2 rankings between these low and high options	All entries have footbaths Water/detergent regularly changed
5F Unsold eggs return to farm	Yes, sometimes, don't know		No
5G Family living off farm; requirements when entering farm	Nothing Some of these things Don't know		Register at office Visitor log book Use protective clothing Enter through shower Park outside farm Answer about previous farm visits that day Scrub/change boots Wash hands, vehicle, equipment
5H non-family employees living off farm; requirements when entering farm			
5I Visitors, non-employees living off farm; requirements when entering farm			
5J Shower and change room for visitors and employees	Yes, but not used		Yes and used

Risk factor	Level of biosecurity		
	Low	Medium	High
	No		
5K Use of own cages when selling live chickens	Yes, sometimes, don't know	No	
5L Cleaning of cages and equipment returning from market	No, sometimes, don't know		Yes No equipment comes back to the farm
<b>6. Level of biosecurity between the farm gate and the shed</b>			
6A Feed shed sealed against rodents and birds	No, sometimes, don't know		Fully sealed
6B Open water on farm	Water lying around No action taken	2 rankings between these low and high options	No water lying around Action taken
6C Spilt feed on farm or in sheds	Yes, sometimes, don't know		No
6D Presence of chickens and ducks wandering around the shed	Yes, always	Sometimes	No
<b>7. Level of biosecurity at the shed door</b>			
7A Construction of shed walls	Other	Plastic	Concrete netting
7B Shed locked at all times	No, sometimes, don't know		Yes
7C Signs at the shed doors	No, don't know	Some	Yes, all
7D Concrete footbath in front of shed entrances + disinfectant	No, don't know	Some	Yes, all
7E Wild birds and rodents entering the shed	Yes, sometimes, don't know		No
7F Action to prevent entry of wild birds and rodents		Built off ground Scarecrows Rat baits Fence around shed Cut trees	Bird proof netting
<b>8. Traffic into sheds</b>			
8A Number of employees working in shed	>2	0-2	0
8B Number of people entering sheds	>2	0-2	0
<b>9. Susceptibility of layer flock</b>			
9A Decision on layer vaccination program	Other	Manager suggest, owner	Owner

Risk factor	Level of biosecurity		
	<i>Low</i>	<i>Medium</i>	<i>High</i>
		decides Contract company	Manager Owner + manager
9B Vaccinate layer chickens	No		Yes
9C Source of vaccines for layers	Spot market Poultry shop Other farmers Direct from feed company	Contract company	Government Direct from drug company
9D Same age of layers in shed	No		Yes
9E Layers quarantined before mixing with others	No		Yes
9F Decision on broiler vaccination program	Other	Manager suggest, owner decides Contract company	Owner Manager Owner + manager
9G Vaccinate broilers for ND	No		Yes
9H Vaccinate broilers for Gumboro	No		Yes
9I Vaccinate broilers for HPAI	No		Yes
9J Source of vaccines for broilers	Spot market Poultry Shop Another farmer Don't purchase	Contract company	Government Direct from drug company

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## Appendix 11: Biosecurity measures for project staff visiting poultry farms



### **BIOSECURITY MEASURES FOR ACIAR PROJECT STAFF VISITING POULTRY ENTERPRISES**

The following procedure must be followed by ACIAR project staff when visiting poultry farms for surveys or training.

1. Do not visit more than two poultry farms per day.
2. Do not visit a poultry market before visiting a poultry farm unless showering and change into clean clothes has occurred.
3. If visiting a poultry farm, you must change into clean clothes, clean hat and clean boots before visiting another poultry farm.
4. If contacting poultry while visiting a farm, you must afterwards shower, wash hair and change into clean clothes, clean hat and clean boots before visiting another poultry farm.
5. Do not touch poultry during biosecurity training and surveys.
6. Wear clean rubber boots, clean coat and clean hat on farms.
7. During disease investigations, where poultry must be handled and possibly necropsied, you must wear rubber boots, coat and hat plus disposable gloves and masks.
8. Before entering a farm, advise the farm owner, manager or person-in-charge that (i) you and your party are wearing clean clothes since last visiting a poultry enterprise, (ii) advise when you and your party have last visited a poultry enterprise.
9. Before entering a farm, at the front gate in view of the farmer or his representative (i) establish a quarantine line, (ii) put on rubber boots, protective cap and coat (iii) wash rubber boots, especially soles, in detergent water, even though clean. Perform all of these steps before crossing the quarantine line to begin the survey or training.
10. On leaving the farm, (i) thoroughly scrub clean rubber boots with water, detergent and brush (ii) step over the quarantine line, (iii) remove hat and coat and place in plastic bag and spray outside of plastic bag with 70% alcohol, (iii) change into street shoes and rinse soles of rubber boots with detergent wash water (iv) store plastic bag and rubber boots in the storage compartment of transport vehicle.
11. Shower, wash hair and change into clean clothes as soon as practical after visiting the last farm of the day.
12. Use car or dish washing detergent to clean boots using the manufacturer's recommended dilution rate.
13. Equipment needed:

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## Appendix 12: Farm minimum biosecurity standards (Bahasa)

### *Standar Biosekuriti Minimum bagi Peternakan Unggas Komersial Non-industri yang Diakreditasi oleh PBUI*

*Sebuah daftar umum yang berisi langkah langkah pengendalian risiko untuk peternakan komersial non-industri tidak tepat untuk dijadikan pegangan dalam melakukan audit biosekuriti karena risiko masing masing peternakan berbeda. Oleh karena risiko masing masing peternakan berbeda dalam tipe dan ukurannya, langkah langkah mitigasi risiko di masing masing peternakan akan berbeda juga dalam tipe dan ukurannya. Demikian juga dengan rencana biosekuriti yang dibuat untuk masing masing peternakan selalu berbeda.*

Standar minimum biosekuriti peternakan untuk peternakan komersial non-industri PBUI disepakati seperti berikut.

Peternakan harus:

- 1 Memiliki konsultan biosekuriti yang telah diakreditasi oleh PBUI. Mereka adalah orang yang telah memperoleh akreditasi sebagai konsultan biosekuriti setelah mengikuti pelatihan konsultan biosekuriti dari PBUI.
- 2 Memiliki rencana biosekuriti peternakan. Rencana haruslah disiapkan dan ditandatangani bersama dengan konsultan biosekuriti. Konsultan harus mengikuti proses perencanaan dari PBUI dalam mempersiapkan rencana yaitu menggunakan prinsip prinsip PATIO/PrePoiPost.
- 3 Mengimplementasikan rencana. Ini berarti harus ada bukti bukti telah diimplementasikannya secara aktif dan berkelanjutan semua elemen dalam rencana biosekuriti peternakan.
- 4 Memasang tanda biosekuriti. Tanda dengan pesan biosekuriti yang sesuai/tepat, peringatan harus dipasang pada tempat yang mudah dilihat pada semua pintu masuk peternakan, di dekat kantor utama, pada pintu masuk kandang, juga tempat penyimpanan pakan serta ruang ganti staf dan pengunjung.
- 5 Melakukan pelatihan staf. Pelatihan *on-farm* untuk staf peternakan agar mereka sadar/paham dengan rencana biosekuriti peternakan serta peran dan tanggung jawabnya dalam mengimplementasikan rencana biosekuriti sangatlah penting. Pelatihan harus dilakukan oleh seorang konsultan biosekuriti minimal setiap tahun paling tidak meliputi review rencana biosekuriti peternakan dan melihat kesesuaian implementasinya di peternakan.

## Appendix 13: Standards for non-farm stakeholders participating in the CMC

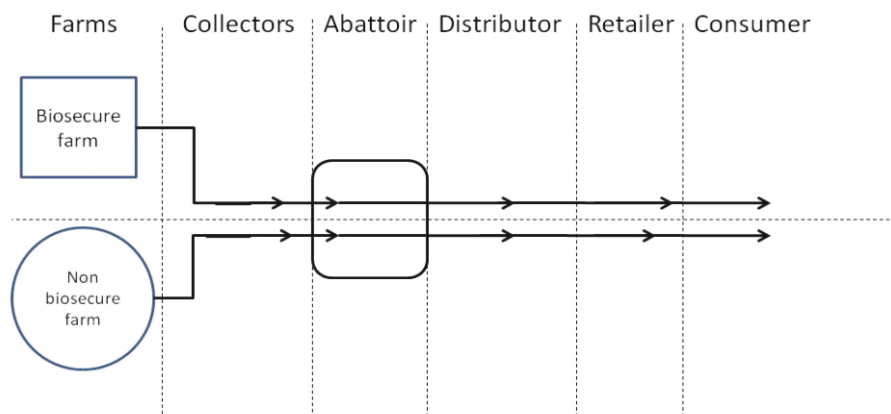
### **Standards for collectors, abattoirs and distributors participating in the healthier poultry market chain**

*The main issues for the post farm gate healthier poultry market chain are not biosecurity but traceability, segregation and hygiene. Consumers and retailers will want confidence that healthier poultry market chain product has (i) originated from biosecure farms (ii) has been processed separately from the product of non- biosecure farms and (iii) has been labeled correctly.*

Food processing hygiene and managing consumer and retailer expectations of a healthier poultry market chain are the issues, not biosecurity. Biosecurity is not the issue because time period from farm to slaughter is only a few hours, too short for infectious diseases to be important. Inadequate hygiene in the abattoir, during distribution and at point of sale has the potential to undo all that good farm biosecurity might achieve in reducing pathogens.

The abattoir will need to provide evidence in the form of written descriptions of the systems for tracing, segregation and hygiene during collection, processing and distribution of product. PBUI trained people are probably the best people to inspect, evaluate and make recommendations on the tracing, segregation and hygiene systems of collectors, abattoirs and distributors; and document them. They could provide a document, using PBUI letterhead describing the systems. The document could then be available to retailers and consumers seeking assurance that the healthier poultry market chain has integrity in traceability, segregation and hygiene of product.

**Figure: Schematic model showing traceability and segregation of product in the healthier poultry market chain from farm to consumer**



### **Recommendations for abattoirs**

#### *Hygiene*

1. compartmentalisation - barriers separate different stages of the slaughtering process ie bird receipt, killing, hot water treatment and defeathering, cutting up
2. traffic control – movement restrictions of people around the abattoir especially between compartments notified by use of strategically placed signs
3. cleaning and disinfection of floor, walls, work surfaces and equipment – soap, hot chlorinated water and scrubbing to achieve spotlessness ie no signs of organic matter such as blood, mud, feathers and faeces



## Appendix 14: Agenda and participant list for 'Towards the adoption of cost-effective biosecurity in NICPS farms' 2010

### WORKSHOP AGENDA

**"Towards the adoption of cost-effective biosecurity in NICPS farms"**

**Tuesday 8th and Wednesday 9th June, 2010**

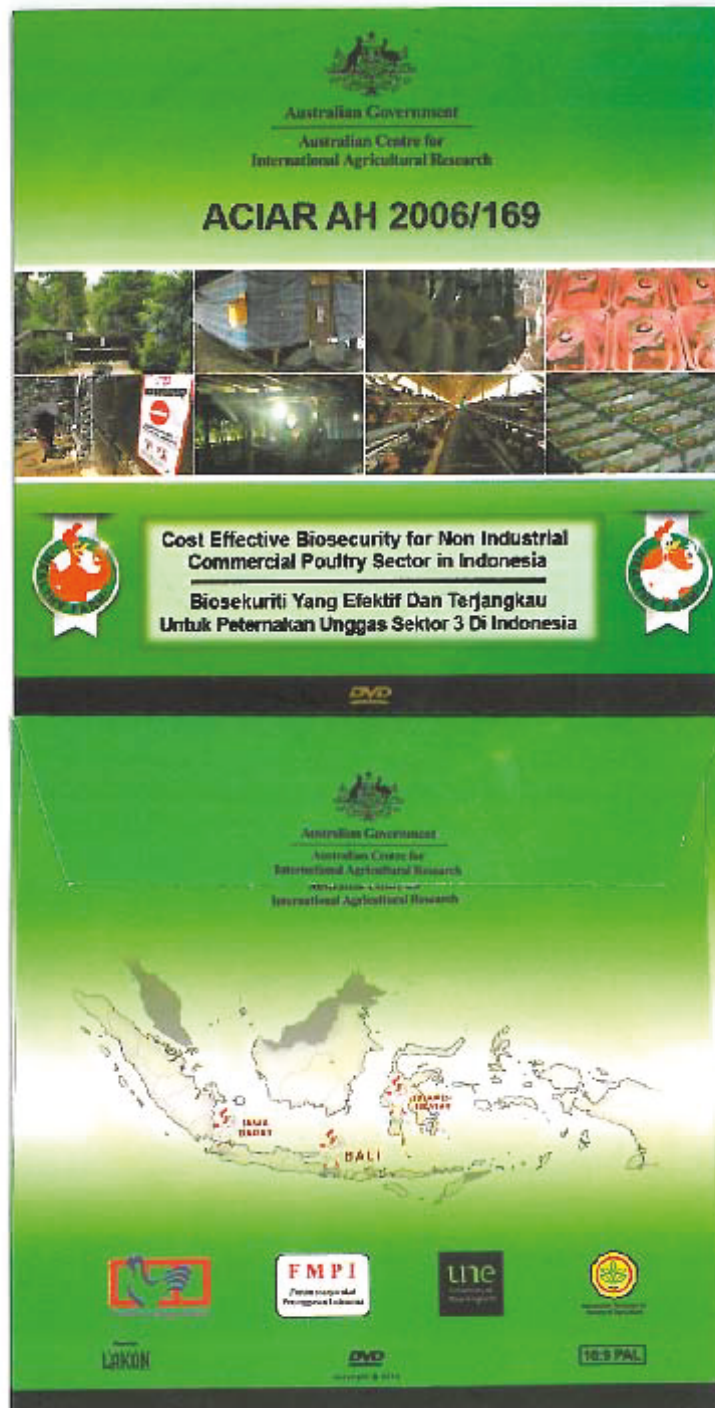
Time	Agenda	Presenter	Moderator
<b>DAY 1</b>			
12.00 – 13.00	Registration, Lunch		
13.00 – 13.15	Opening	Prof. Dr.Tahlim Sudaryanto (ICASEPS)	
13.15 – 13.30	Aims of workshop	Dr. Ian Patrick (ACIAR/UNE)	
13.30 – 13.55	Farmer investment into biosecurity on broiler and layer farms in West Java	Ir. Bugie Kurnianto (ACIAR/IPB)	Dr Tristan Jubb (ACIAR/LHSA)
13.55 – 14.20	Farmer investment into biosecurity on broiler and layer farms in Bali	Dr. IGAA Ambarawati (ACIAR/UNUD)	
14.20 – 14.45	Production and biosecurity on broiler and layer farms in Bali	Ir. Ni Putu Sarini (ACIAR/UNUD)	
14.45 – 15.15	Discussion		
15.15 – 15.45	Afternoon Tea		
15.45 – 16.10	Farm Perspective on Biosecurity	Dr. Kerry Mulqueen (FAO)	Dr Desianto B. Utomo (CP/GPMT)
16.10 – 16.35	Willingness to pay for HPAI vaccination in Indonesian poultry farms	Dr. Nyak Ilham (FAO/ICASEPS)	
16.35 – 17.00	Technical consensus report on 41 AI risk reduction practices for poultry supply chain in Indonesia	Dr. Jeffrey Straka (CBAIC)	
17.00 – 17.30	Discussion		
17.30 - 17.45	Closing first day	Ir. Don Utoyo (ACIAR/FMPI)	

Time	Agenda	Presenter	Moderator
<b>DAY 2</b>			
08.00 – 08.15	Coffee Morning		
08.15 - 08.40	Ranking NICPS poultry farmers with regard to biosecurity adoption	Dr. Ian Patrick (ACIAR/UNE)	Dr Tristan Jubb (ACIAR/LHSA)
08.40 – 09.05	The relationship between biosecurity adoption and farm and farmer characteristics	Dr. Sri Hery Susilowati (ACIAR/ICASEPS)	
09.05 – 09.30	Biosecurity adoption at broiler farm	Ir Wahyuning K. Sejatie (ACIAR/ICASEPS)	
09.30 -10.00	Discussion		
10.00 – 10.30	Morning Tea		
10.30 – 10.55	Lessons learned about biosecurity and the interactions between poultry farms, core companies and government	Dr. Petrus Wicaksana (USDA)	Dr.drh. I Wayan Teguh Wibawan (IPB)
10.55 – 11.20	Private sector biosecurity program impact analysis	Dr. Farid Maruf (CBAIC)	
11.20 – 11.45	Social capital and the response to HPAI	Dr. Edi Basuno (ACIAR/ICASEPS)	
11.45 – 12.15	Discussion		
12.15 – 13.30	Lunch break		
13.30 – 13.55	Consumer willingness to pay for poultry products from biosecure farms in West Java	Ir.M.Iqbal Rafani, M.Sc (ACIAR/ICASEPS/FAO)	Ir Don P. Utoyo (ACIAR/FMPI)
13.55 – 14.20	Consumer willingness to pay for poultry products from biosecure farms in Bali	Ir. Ria Yusuf (ACIAR/UNUD)	
14.20 – 15.10	Discussion		
15.10 – 15.40	Afternoon Tea		
15.40 – 16.45	Where to from here, defining cost-effective biosecurity for poultry smallholders in Indonesia		Dr. Arief Daryanto (ACIAR/IPB)
16.45 – 17.00	Closing remarks		Prof. Dr. Tahlim Sudaryanto & Dr. Ian Patrick

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## Appendix 15: Cover for project information video



## Appendix 16: Consumer brochure with 'Healthy Farm' information

*"Bringing eggs and chickens from safe and healthy farms  
direct to your family"*




**Segar, Aman, Sehat, Utuh & Halal**

Telur dan daging ayam ini berasal dari peternakan yang menerapkan biosekuriti dibawah pembinaan dan pengawasan Pusat Biosekuriti Unggas Indonesia (PBUI).





Pusat Biosekuriti Unggas Indonesia (PBUI) adalah suatu institusi independen yang didirikan oleh Australian Centre for International Agricultural Research (ACIAR) sebagai bagian dari dukungan mereka terhadap industri perunggasan Indonesia. PBUI bekerjasama dengan Forum Masyarakat Perunggasan Indonesia (FMPI) dan pemerintah kabupaten, provinsi dan nasional untuk meningkatkan biosekuriti peternakan ayam pedaging dan petelur komersial (kecil).

Setiap peternak yang dipilih untuk menyediakan telur dan daging "Healthy Farm" telah menyelesaikan Lokakarya Pelatihan yang diselenggarakan oleh PBUI sehingga paham dengan pentingnya peningkatan manajemen dan biosekuriti bagi peternakan mereka.

Setiap peternak yang menyediakan produk "Healthy Farm" telah dievaluasi oleh konsultan biosekuriti yang terlatih oleh PBUI dan telah mengimplementasikan langkah langkah biosekuriti yang ketat dan sesuai untuk peternakan mereka. Setelah peternakan mengimplementasikan 'rencana biosekuriti peternakan' mereka selanjutnya diaudit secara independen. Peternakan yang telah memenuhni dan mempertahankan langkah langkah biosekuriti ini diperkenankan untuk menjual/menyediakan produk mereka kepada kolektor, rumah potong unggas dan supermarket yang telah disetujui.

● ● ●

*Pusat Biosekuriti Unggas Indonesia (PBUI) is an independent institution established by the Australian Centre for International Agricultural Research (ACIAR) as part of their support for the Indonesian poultry industry. The PBUI works with the FMPI and kabupaten, provincial and national government to improve biosecurity on small broiler and layer farms. Each farmer selected to supply 'Healthy Farm' eggs and chicken has completed the PBUI Farmer Training Workshop and so understands the importance of improved farm management and biosecurity for their farms. Each farm supplying 'Healthy Farm' products has been evaluated by a trained PBUI biosecurity advisor and implemented strict biosecurity activities appropriate for their farm. After farms have implemented their 'biosecurity farm plans' they are independently checked. Those farms that meet and maintain these biosecurity activities are allowed to provide their products to approved collectors, slaughterhouses and supermarkets.*

***"Enjoy these product with confidence"***







Dr. Ian Patrick  
ACIAR

Ir. Don. P. Utoyo, MBA  
FMPI

DR. Dewa M.N.Dharma  
PBUI

Developed by 

## Appendix 17: Biosecurity Pamphlet (Bahasa)

### BIOSEKURITI UNTUK UNGGAS YANG LEBIH BAIK





Flu burung adalah penyakit pernafasan yang menular yang disebabkan oleh virus, penyakit ini banyak menyerang unggas seperti ayam, itik kalkun dll. Penyakit menular disebarkan dari satu peternakan ke peternakan lain melalui masuknya unggas yang sakit, masuknya unggas yang baru sembuh dari sakit, pakan, peralatan dan alas kaki yang bergerak dari satu kandang ke kandang yang lain. Unggas yang mati serta kotoran yang tidak ditangani dengan baik. Pakan dan tempat pakan yang terkontaminasi, kendaraan pembawa pakan, DOC yang terkontaminasi. Hewan dan binatang liar. Bagi peternakan unggas, pelaksanaan biosekuriti yang baik akan mampu menurunkan resiko penyebaran penyakit



**APAKAH BIOSEKURITI ITU?**  
biosekuriti adalah usaha-usaha atau langkah-langkah yang harus dilakukan oleh peternak untuk mencegah bibit penyakit memasuki peternakan dan mencegah penyakit yang ada di peternakannya menyebar maupun keluar menulari peternakan lainnya.

**TIGA KOMPONAN DALAM BIOSEKURITI**  
tiga komponen penting dalam biosekuriti yaitu : sanitasi, isolasi dan kontrol lalu lintas. Sanitasi tujuannya adalah menghilangkan agen penyakit sebelum mereka dapat menyebar kedalam maupun didalam peternakan. Kegiatan ini meliputi membersihkan kandang, peralatan dan lingkungan kandang serta desinfeksi. Isolasi dalam hal ini yaitu memelihara ayam didalam kandang, menjaga ayam dalam satu kandang umurnya sama, memisahkan ayam yang sehat dengan ayam yang sakit. Sedangkan kontrol lalu lintas tujuannya adalah mencegah masuk dan keluarnya bibit penyakit baik oleh manusia, hewan maupun benda mati.

Dalam menjalankan usaha peternakan unggas, perlu diterapkannya kedisiplinan dalam hal biosekuriti. Peternakan yang sehat harus memiliki:

1. Daerah bersih kandang ayam, berisi tempat pakan dan minum.
2. Buffer zone pada pintu masuk.
3. Hygienic lock antara buffer dan daerah bersih.
4. Pagar pembatas seluruh daerah operasi.
5. Daerah kotor daerah di luar pagar.
6. Antara daerah kotor dan buffer zone tempat



**APAKAH KEUNTUNGAN DARI BIOSEKURITI?**

- produksi, produktifitas dan keuntungan akan meningkat
- hewan / ternak akan sejahtera
- penggunaan sumber secara lebih efisien
- penggunaan obat, seperti antibiotika dan anthelmentik bisa dikurangi
- mengurangi resiko resistensi patogen yang muncul akibat penggunaan berlebih antibiotika dan anthelmentik
- mengurangi resiko bencana kerugian dan kegagalan bisnis
- meningkatkan nilai pasar dari pada peternakan dan tanah
- mengurangi kemungkinan penularan penyakit unggas ke pekerja dan konsumen
- berhak memperoleh kompensasi jika ada wabah penyakit
- berhak memperoleh pinjaman finansial
- menjadi suplier yang lebih dipercaya oleh konsumen
- menjadi kontraktee yang lebih dipercaya oleh kontraktor



Pelaku bisnis yang terlibat dalam proses pemotongan ayam hingga perdagangan daging ayam sangat banyak dan beragam tingkat pendidikannya, sehingga penyimpangan dalam penanganan dan perdagangan daging ayam sering ditemui di tempat Pemotongan Ayam (TPA) atau di pasar.



**APAKAH 'ASUH' ITU?**  
ASUH merupakan singkatan dari aman, sehat, dan utuh. Aman disini adalah tidak mengandung residu bahan kimia yang dapat menyebabkan penyakit atau mengganggu kesehatan manusia. Sehat, memiliki zat-zat yang berguna bagi kesehatan dan pertumbuhan. Utuh, tidak dicampur dengan bagian lain dari hewan tersebut atau bagian hewan lain. Halal,

Daging ayam merupakan daging yang relative murah dibandingkan dengan daging yang lain (daging sapi, kerbau dan kambing) sehingga banyak dikonsumsi oleh masyarakat dari tingkat atas sampai tingkat bawah, daging ayam yang ASUH adalah daging yang diharapkan oleh semua konsumen, karena dari berbagai aspek daging ayam yang ASUH terjamin jika dikonsumsi oleh masyarakat.




## Appendix 18: Miscellaneous media reports of project activities



Rilis SMS info harga terkini unggas dan telur di Blitar

Cukup dengan Rp 1000,- per sms peternak mendapat informasi harga telur, daging *broiler*, jagung, dan dedak/katul.

SMS center juga berfungsi memberi kisaran harga pada peternak dan menghindari rusaknya harga di pasar akibat ulah tengkulak. Saprodil lain termasuk obat, vaksin dan lain-lain juga diinformasikan. PINSAR juga akan melakukan penjualan saprodil ke peternak melalui SMS ini. "Langkah efisiensi bagi peternak kecil mendapatkan harga lebih murah, karena kapasitas pembelian yang cukup besar," ujar Hidayat. ●*ali-kediri*

### PBUI Gelar Pelatihan Biosekuriti

Bogor (TROBOS). Bertempat di Pusat Studi Analisis Sosial Ekonomi dan Kebijakan Pertanian, Bogor, PBUI (Pusat Biosekuriti Unggas Indonesia) menggelar pelatihan biosekuriti untuk peternak unggas selama dua hari (8-9/6). Pelatihan diikuti oleh 17 peternak unggas, baik *broiler* maupun *layer*, skala kecil yang berasal dari Bogor. Hadir sebagai narasumber Tristan Jubb, *Veterinary Consultant, Livestock Health Systems Australia, Strathdale, Victoria, Australia*.



Pemahaman komprehensif biosekuriti akan memberikan keuntungan ekonomi

Ketua panitia, drh Bugie Kurnianto mengatakan, "Tiga bulan pasca pelatihan akan kita lihat, adakah perubahan teknik pemeliharaan yang dilakukan oleh para peternak." Sementara drh Dewa Made Ngurah Dharma, Manajer Pelatihan dan Pengembangan Kebijakan, PBUI, Balai Besar Veteriner, Denpasar, Bali menjelaskan, pelatihan ini akan memberikan pemahaman komprehensif pada para peternak mengenai keuntungan ekonomi diperoleh bila menjalankan biosekuriti dengan baik. **rubung**

### LPM Nuansa Fapet Undip Gelar Pelatihan Jurnalistik

Semarang (TROBOS). Bertempat di Aula Fakultas Peternakan Universitas Diponegoro Semarang, digelar Seminar dan Pelatihan Jurnalistik oleh Lembaga Pers Mahasiswa (LPM) Nuansa (27-28/5),



Para pemateri pelatihan jurnalistik LPM Nuansa di Undip

dengan tema "Tantangan Jurnalistik di Era Globalisasi". Menurut Mohammad Iqbal Lintang Dalu, Ketua Umum LPM Nuansa, tujuan diadakannya Seminar dan Pelatihan Jurnalistik yang merupakan program kerja awal LPM Nuansa, agar mahasiswa khususnya anggota LPM Nuansa dapat mengembangkan wawasan dan kemampuannya dalam dunia penulisan.

"Besarnya harapan, pelatihan ini akan membawa rekan-rekan Nuansa untuk masuk ke dunia jurnalis di media massa nasional" tutur Iqbal. Hadir sebagai pemateri dalam pelatihan ini Dzaki Mukhtar (TROBOS), Sadarman (Infonet) dan Yoda Hasanudin Maulana (Poultry Indonesia). ●*ade-semarang*

### ASA Gelar Seminar "Pest Control Management"

Jakarta (TROBOS). Bekerjasama dengan Masyarakat Ilmu Perunggasan Indonesia (MIPI) dan Asosiasi Produsen Pakan Indonesia (GPMT), American Soybean Association (ASA) International Marketing menggelar seminar bertajuk "Pest Control Management" (24/5) di hotel Menara Peninsula, Jakarta. Seminar dihadiri sekitar 50 orang dari produsen pakan dan menghadirkan pembicara Bhadriraju Subramanyam, PhD, dari Kansas State University.

Dalam pemaparannya Subramanyam menyampaikan pentingnya *pest control management* bagi industri pakan khususnya *feedmill*. Kegagalan mengatasi permasalahan hama atau hewan pengganggu seperti tikus, serangga dapat menyebabkan kerugian ekonomis. Data dari Subramanyam, hama pengganggu yang berasal dari *invertebrata* seperti serangga dapat menyebabkan kerugian 5-10%. Sedangkan hama pengganggu *vertebrata* seperti tikus dan burung liar bisa jauh lebih besar.

Salah satu yang bisa dilakukan adalah melakukan monitoring terhadap hama pengganggu. Menurut Dr Desianto Budi Utomo, ketua umum MIPI "Dengan monitoring bisa diketahui kapan pertama kali melakukan reaksi atau *treatment* terhadap hama pengganggu, dan juga diketahui efikasi dari *treatment* yang dilakukan." ●*Jeffri*



Peserta dan pembicara berfoto bersama





**Shafa Tasya Kamila**  
**Ingin Jadi Dokter, Ya Minum Susu**

Gadis pemilik lesung pipi khas itu selalu menebar senyum pada siapa saja. Mantan penyanyi cilik itu kini aktif menyuarkan kampanye minum susu. "Dengan minum susu segar setiap hari kesehatan dan kebugaran tubuh bisa terjaga. Jangan lupa juga makan, tidur, dan olahraga yang teratur," kata Duta Susu Nasional itu.

Gadis kelahiran Jakarta, 22 November 1992 ini mengaku setiap hari minum susu minimal 2 kali sehari, pagi dan malam hari. "Aku suka susu dengan rasa apa saja," kata anak bungsu dari 3 bersaudara. Menurut dara imut ini, minum susu selain untuk kesehatan juga mencerdaskan. "Buktinya aku dapat rangking di kelasku," ujar siswi kelas 2 SMA Al-Izhar Pondok Labu itu yang bercita-cita jadi dokter atau arsitek. "Nah, teman-teman yang ingin jadi dokter atau apapun ayo giat minum susu," ajak putri pasangan Gatot Permedi Joewono dan Isverina itu.

Soal mengejar cita-citanya, Tasya mengaku masih mempertimbangkan kesibukannya. "Takutnya *nggak* bisa bagi waktu. Tapi jika cari bidang yang lebih enteng, sayang prestasi belajarku tidak dimaksimalkan, jadi lihat nanti aja *deh*," katanya polos. Bintang sinetron dan model iklan itu kini tengah membintangi serial komedi di televisi. ●TROBOS/Melika





**Sadarma Suhaim Saragih**  
**Biar *nggak* Kena Macet**

"Selamat pagi," ucapan ramah itu memecah kesunyian ruangan seminar yang masih sepi pagi itu. Jarum jam tepat di angka 7. Disaat peserta ataupun pembicara lain belum hadir, Sadarma Suhaim Saragih, hadir mendahului. "Saya sengaja datang lebih awal biar tidak kena macet" ujar Sadarma, yang pada hari itu menjadi salah satu pembicara pada seminar yang digelar TROBOS beberapa waktu lalu di Jakarta.

Setelah bertegur sapa dan sedikit berbincang, Sadarma pun tak langsung diam. Pria yang menjabat sebagai Kepala Sub Direktorat Pengembangan Ekspor pada Direktorat Pengolahan dan Pemasaran Hasil, DKP ini asik dengan perangkat laptopnya. Sadarma pun mencoba *mereview* kembali materi presentasi yang akan dibawakannya hari itu.

"Semuanya harus tepat mas, biar tidak ada kesalahan data pada saat presentasi. Ini keuntungan berangkat lebih pagi selain tidak kena macet masih bisa mempersiapkan diri," demikan ujar Sadarma yang juga hobi nonton dan musik ini kepada TROBOS. ●TROBOS/jefri

**Tristan Jubb**  
**Biosekuriti, Asuransi bagi Peternak**

"Biosekuriti adalah asuransi bagi peternak," ucap pemilik gelar panjang BVSc, MVS, PhD, di belakang namanya. *Veterinary Consultant, Livestock Health Systems Australia*, Strathdale, Victoria, Australia yang sudah sering datang ke Indonesia ini mengaku peternakan Indonesia sangat berbeda dengan yang ada di Australia. Menurutnya beberapa penyakit yang masih ditemui di Indonesia, belum tentu ada di Australia. Masih menurut pria asli Australia itu, Indonesia merupakan tempat yang cukup unik, karena berada di daerah Tropis.

"Berbagai penyakit bisa muncul di Indonesia, karena kondisi di Indonesia memang cukup memungkinkan," jelas Tristan. Pria paruh baya itu mengaku keberadaannya di Indonesia untuk berbagi pengetahuan terkait teknik biosekuriti, sebagai wujud konkrit kerjasama pemerintah Australia dengan pemerintah Indonesia. "Perlu penerapan biosekuriti secara menyeluruh untuk mencegah adanya kerugian di awal, tengah, maupun akhir dari kegiatan produksi di peternakan," jelas pria yang mengaku bisa sedikit berbahasa Indonesia itu. Tristan menambahkan, tindakan mencegah biayanya lebih murah daripada mengobati.

"Setiap daerah memiliki keunikan sendiri, setiap wilayah memiliki permasalahan sendiri, karena itu penerapan biosekuriti mesti disesuaikan dengan kebutuhan daerah itu sendiri," jelas pria yang sering bepergian ke berbagai negara. ●TROBOS/rubung



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