

‘Fixing Humpty Dumpty’: Piecing together skills and knowledge for workforce development in the Australian egg industry



Angus Crossan

2012 AgriFood International Fellowship

Fellowship funded by AgriFood Skills Australia

AGRIFOOD
SKILLS AUSTRALIA





**International
Specialised
Skills
Institute**

ISS Institute
Level 1
189 Faraday Street
Carlton Vic
AUSTRALIA 3053

T 03 9347 4583
F 03 9348 1474
E info@issinstitute.org.au
W www.issinstitute.org.au

Published by International Specialised Skills Institute, Melbourne

Extract published on www.issinstitute.org.au

© Copyright ISS Institute July 2013

This publication is copyright. No part may be reproduced by any process except in accordance with the provisions of the Copyright Act 1968.

Whilst this report has been accepted by ISS Institute, ISS Institute cannot provide expert peer review of the report, and except as may be required by law no responsibility can be accepted by ISS Institute for the content of the report or any links therein, or omissions, typographical, print or photographic errors, or inaccuracies that may occur after publication or otherwise. ISS Institute do not accept responsibility for the consequences of any action taken or omitted to be taken by any person as a consequence of anything contained in, or omitted from, this report.

i. Executive Summary

Training has not been readily available for Australian egg producers and their staff for more than a decade. There was a time when extension programs and skills training were more readily available to producers via state agencies; however, the system “had a great fall” and is essentially in pieces with respect to resources, delivery mechanisms to producers and available funding.

A recent initiative of the Australian Egg Corporation Limited (AECL) has been focused on developing a training program, ‘Australian Egg Industry Skills and Knowledge Development’, to address the need for training within in the egg industry. The main driver for this program is to provide those working within the egg industry, either as employees or owner-operators, opportunities to develop and flourish in their chosen careers, which in-turn provides benefits for the Australian egg industry. This initiative is a collaborative partnership between industry, government and training providers. This ISS Institute Fellowship report, sponsored by Agrifood Skills Australia, further illustrates the multi-partner collaboration to support the development of a world leading skills development program.

The stated purpose of the Fellowship was to review selected international models for the delivery of skills and associated resources for contemporary egg production with a view to strengthening our local program and establishing an international network of experts and resources. Following a review of the current challenges of our Skills and Knowledge development program, two key training related issues emerged: those within the production system (resources to assist the skills development of workers); and those associated with the delivery of skilled training to support the needs of the industry (administration and implementation of the program).

The international research program provided a remarkable and informative experience. It far exceeded expectations and the welcome provided by international colleagues was extremely generous. Over 30 contacts were met during the Fellowship from the United States, Canada, New Zealand and the United Kingdom. A strong foundation was established with regard to a network of egg production and training experts, thereby meeting a key aim and successful outcome of the Fellowship. The identification of resources (another key aim) was also successful in enabling access to a collection of resources. The resources and materials covered key areas of interest, including egg quality and grading resources, industry OH&S resources and information, a comprehensive egg production course plan (with knowledge criteria and assessment benchmarks) and insights into on-line learning systems and approaches.

Other key insights were gained during the Fellowship which was not foreseen and added tremendous value to the experience. For example, the strength and importance of linking extension and training; the critical need to maintain a close link between industry and training providers to ensure the training provided is relevant; the importance of maintaining government funding for training; the need to focus on supporting ‘life-long’ learning to support workforce development; and the need to establish and cultivate a training culture within industry and egg production organisations to realise the greatest benefits from training investments. Above all, to maintain a viable training system there needs to be legacy of expertise that is charged with the ongoing support of skills development in the industry such as a core centre or institute.

This Fellowship report concludes with a series of recommendations directly related to the outcomes of the Fellowship research and the insights gained. The leanings gained will directly benefit the Australian Egg Industry Skills and Knowledge Development Program, those working in the Australian Egg Industry and its stakeholders including Government and consumers. Whilst it is not possible to “put Humpty together again”, this Fellowship has provided insight to build a better, more robust training model.

Table of Contents

i	ii. Abbreviations/Acronyms
1	1. Acknowledgements
1	Awarding Body – International Specialised Skills Institute (ISS Institute)
2	Supporters
2	Organisations Impacted by the Fellowship
3	2. About the Fellow
4	3. Aims of the Fellowship Program
5	4. The Australian Context
5	4.1 Summary of industry structure
6	4.2 Current Skill and Knowledge development in the Australian egg industry
8	4.3 Egg Industry Needs
9	4.4 SWOT Analysis
10	5. Identifying the Skills and Knowledge Enhancements Required
10	5.1 Challenges with skills development in the egg supply-chain
11	5.2 Challenges with delivering skills development opportunities to the egg industry: a small, geographically dispersed industry.
12	6. The International Experience
13	6.1 Destination: Atlanta and Athens, Georgia, US
16	6.2 Destination: Pennsylvania State University, Pennsylvania, US
19	6.3 Destination: Hy-Line International, Dallas Center, Iowa, US
22	6.4 Destination: Iowa State University, Ames, Iowa, US
23	6.5 Destination: Guelph, Lyn and Ottawa, Canada
26	6.6 Destination: AglTO and Egg Producers Federation of New Zealand (Inc.), Wellington and Auckland, New Zealand
28	6.7 Destination: Harper Adams University College, Newport, Shropshire, UK
30	6.8 Destination: Reaseheath College, Nantwich, Cheshire, UK
33	6.9 Destination: Myerscough College, Bilsborrow, Lancashire, UK
36	6.10 Destination: Noble Foods Ltd, Lincolnshire, UK

Table of Contents

39	7. Knowledge Transfer: Applying the Outcomes
42	8. Recommendations
42	Recommendations and actions arising from this Fellowship
43	Concluding Comment
44	9. References
46	10. Appendices

ii. Abbreviations/Acronyms

AD	anaerobic digestion
AECL	Australian Egg Corporation Limited
CRC	Co-operative Research Centre
CPRC	Canadian Poultry Research Council
DEEWR	Department of Education, Employment and Workplace Relations
DEFRA	Department of Environment, Food and Rural Affairs (UK)
GVP	gross value of production
ICC	Industry Consultative Committee
NVQ	National Qualification System (UK)
NZQA	New Zealand Qualifications Authority
OH&S	Occupational Health and Safety
PIC	Poultry Industry Council (Canada)
PM	post mortem
R&D	Research and Development
R,D & E	Research, Development and Extension
RTO	Registered Training Organisation
TAFE	Technical and Further Education (Institution)
TNA	training needs analysis
QA	Quality Assurance
UEP	United Egg Producers
USDA	United States Department of Agriculture

1. Acknowledgements

Angus Crossan would like to thank the following individuals and organisations who gave generously of their time and their expertise to assist, advise and guide him throughout the Fellowship program.

Awarding Body – International Specialised Skills Institute (ISS Institute)

The International Specialised Skills Institute Inc is an independent, national organisation that for over two decades has worked with Australian governments, industry and education institutions to enable individuals to gain enhanced skills and experience in traditional trades, professions and leading-edge technologies.

At the heart of the ISS Institute are our Fellows. Under the **Overseas Applied Research Fellowship Program** the Fellows travel overseas. Upon their return, they are required to pass on what they have learnt by:

1. Preparing a detailed report for distribution to government departments, industry and educational institutions.
2. Recommending improvements to accredited educational courses.
3. Delivering training activities including workshops, conferences and forums.

Over 200 Australians have received Fellowships, across many industry sectors. In addition, recognised experts from overseas conduct training activities and events. To date, 22 leaders in their field have shared their expertise in Australia.

According to Skills Australia's 'Australian Workforce Futures: A National Workforce Development Strategy 2010':

Australia requires a highly skilled population to maintain and improve our economic position in the face of increasing global competition, and to have the skills to adapt to the introduction of new technology and rapid change.

International and Australian research indicates we need a deeper level of skills than currently exists in the Australian labour market to lift productivity. We need a workforce in which more people have skills, but also multiple and higher level skills and qualifications. Deepening skills across all occupations is crucial to achieving long-term productivity growth. It also reflects the recent trend for jobs to become more complex and the consequent increased demand for higher level skills. This trend is projected to continue regardless of whether we experience strong or weak economic growth in the future. Future environmental challenges will also create demand for more sustainability related skills across a range of industries and occupations.

In this context, the ISS Institute works with Fellows, industry and government to identify specific skills in Australia that require enhancing, where accredited courses are not available through Australian higher education institutions or other Registered Training Organisations. The Fellows' overseas experience sees them broadening and deepening their own professional practice, which they then share with their peers, industry and government upon their return. This is the focus of the ISS Institute's work.

For further information on our Fellows and our work see <http://www.issinstitute.org.au>.

Patron in Chief
Lady Primrose Potter AC

Patrons
Mr James MacKenzie
Mr Tony Schiavello AM

Board Chair
Mr John Baker

Deputy Chair
Ms Rosemary O'Connor

Founder/Board Member
Sir James Gobbo
AC, CVO

Treasurer/Board Member
Mr Jack O'Connell AO

Board Secretary
Mr David Wittner AM

Board Members
Prof. Amalia Di Iorio
Ms Bella Irlight AM (CEO)
Mr Jon Onley
Ms Alisia Romanin

1. Acknowledgements

Fellowship Sponsor

AgriFood Skills Australia develops and implements workforce development strategies and the industry's nationally endorsed qualifications to meet the current and emerging needs of agrifood enterprises, employees and students throughout regional and urban Australia. They have sponsored a number of Fellowships over many years, covering a very wide range of challenges faced by the Australian agrifood industry.

Supporters

The participation in this Fellowship would not have been possible without the support from the key supporters mentioned below. Many thanks go to Mr James Kellaway (MD, AECL), Mr John Michael (Faculty Director, Trades and Primary Industries, TAFE NSW New England Institute) and Professor Mingan Choct (CEO, Poultry CRC), for their letters of support and words of encouragement. It was inspiring to receive the encouragement and support to apply and then undertake the Fellowship.

In addition, the support of AECL with respect to additional funds and the flexibility with time away from the office to ensure the successful completion of a 'rather ambitious' plan for the international experience was greatly appreciated. I would also like to acknowledge Research Development, Extension and Training team who were flexible and able to work effectively across time zones whilst I was undertaking the Fellowship.

Organisations Impacted by the Fellowship

This Fellowship is expected to impact a diverse set of stakeholders; from Government to agricultural production and training organisations. Specific government organisations include the Australian Government Departments of Agriculture, Fisheries and Forestry (DAFF) and Industry, Innovation, Climate Change, Science, Research and Tertiary Education, and the Department of Education, Employment and Workplace Relations (DEEWR). The government departments related to training and workforce development in state jurisdictions are also important to ensure consistency in development and funding initiatives.

Industry organisations that are expected to be impacted by the Fellowship include the Australian Egg Corporation Limited (the Fellow's employer) and egg producers and stakeholders within the egg production supply-chain such as the companies currently involved and those that will be involved in egg industry training programs in the future. The Poultry Cooperative Research Centre, an organisation partially funded by AECL, other poultry companies and the Australian Government, should also be impacted.

Finally, the key organisations in the egg industry's current Skills and Knowledge development program will be impacted through the increased insight and learning. This includes AgriFood Skills Australia, the sponsor of this Fellowship and strong supporter of the egg industry's training initiatives. Most importantly and directly, the two key RTOs that partner in program delivery - TAFE NSW (New England Institute) and CHM Alliance Pty Ltd. - will also benefit from the insights gained through this Fellowship.

2. About the Fellow

Name: Angus Crossan

Employment: Program Manager – R&D, Australian Egg Corporation Limited

Qualifications:

- » Bachelor of Science (Honours in Chemistry), The University of Sydney, 1996
- » PhD (Chemistry and Environmental Science), The University of Sydney, 2002

Brief Biography:

In January 2009, Angus Crossan joined AECL as Research and Development (R&D) Program Manager for the egg industry. Before AECL, Crossan held a Research Fellowship at the University of Sydney and also ran a specialist consultancy business.

The Fellow originally trained as a chemist, graduating with an honours degree from the University of Sydney. He then applied his skills to primary industry and sustainable agribusiness during his PhD and subsequent research, consulting and business activities.

Crossan has experience in the public and private sector across a number of industries including cotton and sugar production, forestry, food processing and egg production. Since joining the AECL team, he has been heavily involved in developing the egg industry's R&D strategies to overcome the challenges of contemporary egg production. His main objective and motivation is to maximise the return on investment of the egg industry's R&D levy on behalf of all egg producers.

During his time working for the Australian egg industry, Crossan has achieved significant leverage of research, development and extension (R, D & E) investment through building strategic relationships with commercial partners and using government incentive schemes. By building collaborative relationships and securing external investment, Angus has managed an investment leverage ratio of approximately 1:9, resulting in significant return on investment.

Additional returns from research and investment have been made through the development of an extension program that integrates research solutions and tools for business improvement. His latest challenge involves developing and launching an industry-wide vocational and educational training program to further support the industry, with respect to workforce development and providing the skills required to facilitate on-farm innovation and efficiency to meet the challenges of the future.

3. Aims of the Fellowship Program

This Fellowship had a number of aims:

- Build a network of international leaders of training in egg production
- Evaluate the various models used for delivery of training, paying particular attention to flexible models, new technology and those that overcome the challenges associated with distance learning
- Review training resources (including assessment and evidence material) used in other regions and discuss the possibility of accessing those suitable to Australian production systems (via a licence or sharing of intellectual property as required)
- Disseminate the outcomes of this Fellowship and provide opportunities for other industries to learn from the experience gained
- Incorporate the findings, suitable resources and delivery models identified during the Fellowship into the egg and poultry industries training program.

There are a number benefits expected through meeting these aims that provide ongoing support for Australian best practice in egg production training. This will be realised through the lessons learnt and experience from international experts. If relevant training materials can be identified, this will reduce the costs and time involved in developing contemporary and relevant resource material. Ultimately, the Fellowship program will facilitate the development of a more robust and well researched model to overcome the challenges associated with skills and knowledge development in the egg industry and other similar agricultural production sectors.

4. The Australian Context

Co-ordinated training has not been readily available for Australian egg production for more than a decade. Recent shifts in demographics, of both production systems and employees, means that this nationally focussed program is addressing a critical deficiency.

The aim is to provide an ongoing and flexible training program that covers all aspects of the supply-chain; up-skilling and providing qualifications for the range of people working in the industry, from farm hands and shed managers (Certificates II to IV) to quality assurance and operational managers (Certificate IV to Diplomas).

The preliminary focus of this report is on egg production; however, as a core participant of the Poultry CRC, other poultry industries (for example, chicken meat industry, turkey industry and duck industry) are expected to directly benefit from the insight provided. This report is also expected to benefit other small and geographically dispersed industries that need to develop or review training programs.

4.1 Summary of industry structure

The Australian egg industry is a small but dynamic industry within Australia's agri-food sector. The domestic industry's GVP at farm gate is approximately \$572.2 million per annum and production takes place in most states and territories. In total, there are approximately 339 egg farms that carefully manage in excess of 22 million hens, including pullets, with a production total of 392 million dozen eggs per year (AECL, 2012).

New South Wales and Victoria are estimated to be the largest egg producing states with 44 per cent and 26 per cent of the layer flock respectively with Queensland possessing 11 per cent. The remaining states contain smaller populations of the national layer flock with Western Australia constituting eight per cent, South Australia and the Northern Territory seven per cent and Tasmania four per cent.

The Australian egg industry represents less than one per cent of total laying hens globally with over 83 countries globally producing 66.538 billion dozen eggs from a total hen population of 4.3 billion laying hens (AECL, 2012).

There are three main production systems used by egg producers in Australia and eggs from these production systems are termed cage, barn-laid and free range (PISC, 2001):

1. Cage systems: Birds are continuously housed in cages within a shed
2. Barn-laid systems: Birds are free to roam within a shed that may have more than one level. The floor may be based on litter and/or other material such as slats or wire mesh
3. Free range systems: Birds are housed in sheds and have access to an outdoor range.

Eggs from all three recognised production systems are distributed throughout the food supply chain in response to demand from the different market sectors. See Figure 1 below showing a schematic of egg supply and distribution.

The share of demand from all three recognised production systems is creating structural change within the industry. This is more obvious at the retail level, where there has been a long-term increase in the demand for eggs produced from non-cage production systems from a low base. Currently, the retail volume of cage eggs is 55 per cent, barn-laid eggs nine per cent and free-range eggs 36 per cent (including two per cent organic). The retail sale of eggs totals \$523.5 million and includes sales through supermarket chains and independent stores (AECL, 2012).

Non-cage systems require a greater level of skill to manage the additional challenges of such systems, including greater disease pressure, different nutritional requirements and behavioural problems such as cannibalism. Therefore, the changes in market demands are in turn increasing the need for skills development in the industry.

4. The Australian Context

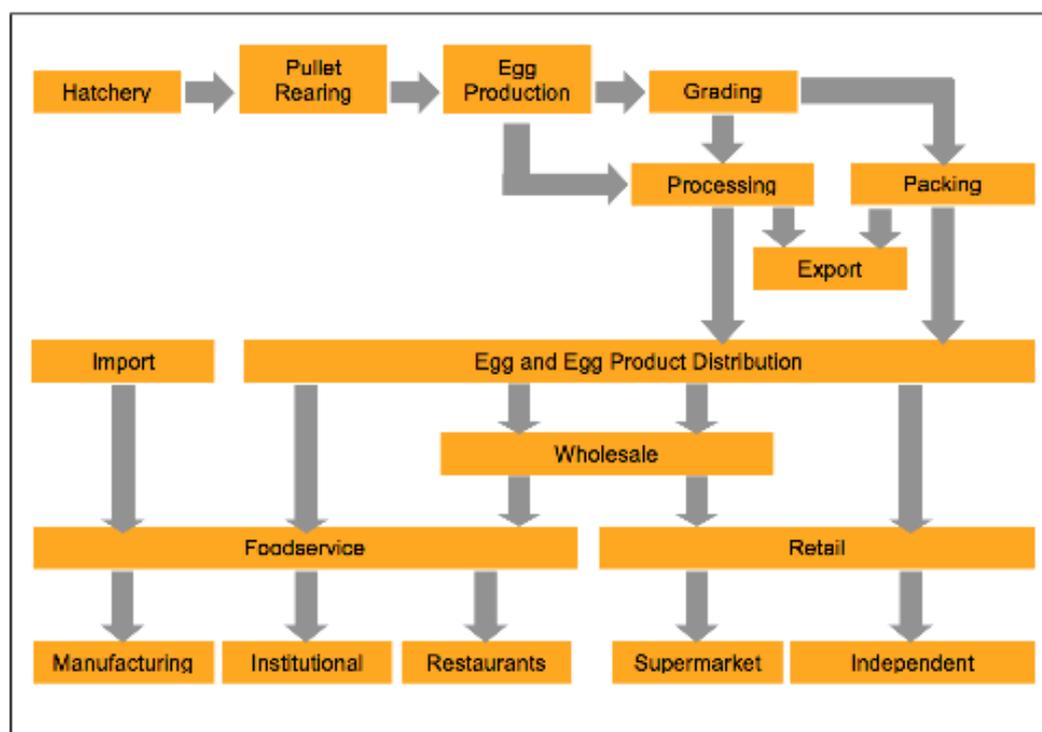


Figure 1: Schematic of Australian egg supply chain.

4.2 Current Skill and Knowledge development in the Australian egg industry

The aim of the industry's new training program is to provide a series of high-quality courses that are specifically designed to meet the needs of contemporary egg production. This is an important project for AECL. It fulfils a vital need within the industry, helps reduce the cost of production, provides development and career opportunities and equips the people in the egg industry with the capability to more effectively meet the challenges of the future. The benefits of this industry extension strategy are far-reaching and can be measured on-farm and throughout the supply chain.

4.2.1 Striving to Benefit Egg Businesses

AECL expects benefits from training for egg producers to be measured in increased productivity, profitability and reduced staff turnover. Increasing the skill level within an organisation can add further value by increasing operational versatility, as staff can perform multiple tasks and enable the organisation to more readily respond to short and long term challenges, which is critical for economic sustainability. In 2000, the National Centre for Vocational Education Research (NCVER) showed that returns to organisations from training vary from 30 to 7000 per cent (Doucouliagos and Sgro, 2000). It is hoped that high returns will be reported from a quantitative review of the AECL training program in due course.

Improved productivity is an important factor for continued economic growth, especially in a competitive marketplace, or when the price is relatively inflexible as is the case in some egg sectors. In 2001, Smith reported that effective training can reduce the wastage of time and materials, maintenance costs of machinery and equipment, the number of workplace accidents, recruitment costs via internal promotion and absenteeism.

4. The Australian Context

Importantly, as well as improving profit margins, training can improve the “soft skills” such as inter-staff communication, leadership and time management, resulting in improved staff morale and satisfaction. It was demonstrated that well trained staff can be up to 230 per cent more productive than their untrained counterparts.

Not surprisingly, the more specific training is to a business the higher the returns and greater the benefit of training to that business (Blandy et al., 2000). Therefore, the more the industry’s training is focused on the skills and knowledge relating to laying hens, egg production and the associated supply-chain the greater the expected impact and benefit for students and their businesses. To this end, this Fellowship project seeks to identify any relevant and contextualised resources that are used in other egg industries that may be available to import, possibly via an appropriate licence agreement; thus providing faster access to required resources and strengthening the international network.

4.2.2 A Summary of AECL’s emerging Skills and Knowledge Development Program

The program consists of three core activities, which are to identify industry needs, develop highly relevant training material and delivery quality training to the industry. The most important aspect of the program is that it strives to make high-quality training readily accessible to egg producers and their employees.

4.2.2.1 Identifying needs

To ensure the training project meets industry needs, the needs of the industry must be understood. To this end, feedback from egg producers, provided through regular contact with AECL, has been used to effectively identify needs and develop appropriate courses. More structured training needs analysis (TNA) is proposed to be conducted regularly to add to the specific feedback from egg producers. An Industry Consultative Committee (ICC), whose membership includes egg producers and training experts, has recently been formed to provide feedback on industry needs and guide the development of the Skills and Knowledge Development Program. It is critical that the needs of producers are continually and regularly reviewed to ensure the program continues to address the needs of the industry.

4.2.2.2 Training resources and materials

Ensuring there are relevant training resources available to egg producers is an integral aspect of the project and one of the key focuses of this Fellowship. This means that the egg industry has access to the specific information and correct practices to effectively manage or work on an egg farm. Resources include course manuals, reference material, experts to deliver relevant material and skilled trainers and assessors.

Resources are developed to cover the requirements of the training package (competencies) and special industry skills that may not be covered in the formal units. This aspect of the project is an area that requires the largest collaboration with other agencies and industry experts. This part of the program also requires the resources for regular review to ensure that as production systems develop the necessary skills are updated.

4.2.2.3 Facilitation and delivery: co-ordination, funding and skills transfer

Finally, and most importantly, the skills and knowledge must be effectively transferred to the industry. This aspect of the program is the other key focus of this Fellowship. Without an effective model to deliver training, an enduring and economically sustainable program is unlikely to be developed and maintained, as was observed before this program began.

4. The Australian Context

The facilitation role of the project can be broken down into two main components: organisation and delivery of training, and subsidising or covering costs. Delivery of training requires suitably skilled and accredited trainers with egg specific expertise to source and develop training programs, collate resources to match competencies and provide assessment for certification. The AECL project currently has agreements with two RTOs to help deliver training to egg producers and employees. However, the models require funding not only for delivery to students but to review and continually improve and adapt to changing needs over time.

The program needs to deliver training to all states and also requires a flexible structure to match the needs of both large and small enterprises. These requirements may uniquely characterise the Australian egg industry with respect to training needs. The focus of this Fellowship is to review selected international models that may be used to overcome similar delivery challenges and skill deficiencies and that can provide insight on how to address local challenges.

4.3 Egg Industry Needs

With respect to the on-farm workforce, similar challenges among producers are commonly reported. These challenges include costs of training new staff and high staff turnover, finding new staff and the facilities to train new and existing staff; all of which have clear economic impact.

Anecdotal feedback indicates a strong sentiment that other egg businesses “poach” well-trained staff and there was confusion expressed about the providers of training such as which Registered Training Organisations (RTOs) could provide training and how courses are structured. Verbal feedback from producers indicates that it was more difficult for egg producers to access satisfactory training services than ten to 15 years ago. This is also evidenced by the colleges that used to deliver egg production training but are no longer offering such courses (Runge, 2012). This situation, which will be examined in more detail in section six (International Experience), provided the inspiration for the title of this report and ambitious plan for the industry’s Skills and Knowledge Development Program supported by this Fellowship.

Interestingly, skill deficiencies per se, are not widely reported. Industry members rarely indicate that the skills are deficient on-farm. In contrast, feedback from pilot courses shows that there are practices being undertaken on-farm that are not current best practice with respect to farm management and animal welfare (Stewart, 2012).

This is likely a result of “not knowing what one doesn’t know” due to not having readily available access to skills development programs. Although this indicates the ingenuity that producers show to meet the day-to-day challenges to produce food for Australians, it is critical that improved methods are made readily available.

In summary, there are common workforce development needs across all egg production systems. The key challenges have been listed below:

- Access to training resources for new staff and the development of existing staff
- Availability of skilled trainers and experts
- High turnover of staff
- Ability to attract new staff
- Ageing demographic of egg producers and family owned businesses
- Structural changes in the industry with increased reliance on QA programs, food safety issues, welfare and non-cage production systems

4. The Australian Context

- No clearly defined career path, opportunities or programs to enter the industry.

4.4 SWOT Analysis

From the above situational analysis, it is clear that there are significant workforce development challenges within the egg industry. It would not be possible to cover all of these in this Fellowship. The priority is on the development and delivery of skills to producers, that is, access to resources and trainers. This is the priority because these are needed before the other workforce development challenges can be address. It is a case of 'first things first'. There are two key aspects related to this skills deficiency within the egg industry: access to well contextualised contemporary resources and a systematic delivery system.

For the purposes of this Fellowship, these separate challenges were each the focus of a SWOT analysis (see tables below). After reviewing the SWOT analysis, it is clear there are linkages between these two challenges, which are not surprising considering the common goal. However, the important difference is that there will need to be separate strategic and operational approaches to address the respective weaknesses and threats and take advantage of the strengths and opportunities of both aspects of the program.

SWOT 1: Resource development for skills training in contemporary egg production

Strengths	Expertise available to provide expert information; improved practices with contemporary production systems; large R&D base to build best practice; need indicated within industry; program linkages within the industry.
Weaknesses	Limited structured materials available; no formal qualification recognition; poor contextualisation; rapid redundancy of some materials; limited formats; broad skill and knowledge needs.
Opportunities	New technology to assist with delivery; improved communication between students; reduce risk (WH&S); increase moral and staff engagement.
Threats	Increasing regulatory pressure (food safety and welfare); internet technology exposing poor practices; rapid changes in systems making resources redundant; intellectual property infringements.

SWOT 2: Delivery and administrative functionality to support skills and knowledge development

Strengths	Passionate team; large knowledge and experience base available; expertise readily accessible; linkages with industry; support from AECL.
Weaknesses	Small team, geographically disperse; time and competing priorities; ability to service widespread needs; timeliness of delivery of training; resource availability, accommodation and HR strategy.
Opportunities	Technology to increase access to information; funding to support development via AECL; potential for large market share.
Threats	Aging trainers and experts; RTOs competing for students; on-going program identity and sustainability.

5. Identifying the Skills and Knowledge Enhancements Required

There are examples of areas in Australian industries and practices where there are weaknesses in innovation, skills, knowledge, experience, policies and/ or formal organisational structures to support the ongoing successful development and recognition of individuals and the particular sector. The focus of all ISS Institute Fellowships is on applied research and investigation overseas by Australians. The main objective is to enable enhancement and improvement in skills, knowledge and practice not currently available or implemented in Australia and the subsequent dissemination and sharing of those skills and recommendations throughout the relevant Australian industry, education, government bodies and the community.

Two types of skill and knowledge enhancement areas have been identified within the Australian egg industry's Skills and Knowledge Development Program: those in the production system (skills development) and those associated with the delivery of skilled training to support the needs of the industry (administration and operations). These two areas in need of enhancement will be covered separately in the following sections.

5.1 Challenges with skills development in the egg supply-chain

As coordinated training has not been readily available to egg producers and their employees there are a number challenges with respect to training that have emerged. Whilst there are some organisations within the industry that have a keen training culture and can maintain the skills required for efficient production and maximum profits, there are others that do not have the resources to ensure up-to-date skills are being practiced within their teams.

To address the necessary skill enhancement this Fellowship focused on gaining an understanding of the critical skill-sets required for modern production systems from a review of the Model Code of Practice for the Welfare of Animals – Domestic Poultry (PISC, 2001) and industry QA standards. It was determined that the international experience would focus on identifying global expertise that could be readily imported to address local deficiencies across the following areas and practices:

- Vaccination training: a skill that requires formal training, but such courses are not currently available in Australia. There are difficulties with availability and reliability of external crews. Egg producers are electing to undertake vaccination on-farm and therefore require training.
- Beak trimming: the code-of-practice requires that trained personnel must undertake beak trimming. A relatively large shift toward free range production requires more reliance on husbandry skills including beak trimming to manage hen welfare and flock performance.
- Husbandry and biosecurity: an integral aspect of risk management that requires all employees, consultants, contractors and farm visitors to have some level of induction training. An industry relevant course is essential to cover briefing/induction to the complete skill set for higher level qualifications.
- Quality assurance: a new egg production standard is being developed that will require formal training in QA systems and the technical skills required to meet the various modules for the program such as environmental management and on-farm food safety programs.

Specific action: Collect or document examples of resources addressing these skills deficiencies; explore opportunities to make use of the identified materials in Australia; integrate information and international approaches to training and delivering these skills.

5. Identifying the Skills and Knowledge Enhancements Required

5.2 Challenges with delivering skills development opportunities to the egg industry: a small, geographically dispersed industry.

In addition to developing the skills to producers and their staff, the industry requires insight into how to provide a long-term skills development program. It is clear that primarily the economic model must be appropriate to sustain the delivery of training. This is expected to be supported by delivery models that are suitable for the industry and ensuring that the training delivered meets the needs of industry.

The other key focus of the Fellowship was to provide international insight to effectively deliver the aforementioned training needs. The Australian egg industry must have programs that can develop and importantly maintain up-to-date and contextualised resources; effectively manage the costs associated with providing training; ensure there is a skilled team available to deliver the program and skills development; and ultimately build a training culture within the industry.

To address this aspect of the necessary skills and knowledge enhancements' the Fellowship focused on gaining an understanding of modern approaches to training in world leading egg industries to overcome the challenges inherent in Australian egg production:

- Review approaches to effectively deliver industry specific skills and knowledge to a diverse student base with respect to language and literacy skills, age and experience and size of operation
- Review international approaches to replace out-dated or non-existent resources across most of the Australian supply chain
- Identify and assess modern tools to overcome the challenges of geographical separation of the industry (for example online or problem-based scenarios)
- Characterise effective delivery models that enable flexibility according to student and producer needs that maintain the required qualification benchmarks.

Specific action: Examine delivery models and record feedback regarding the effectiveness of structures and activities; review and if suitable integrate new insights into the administration of our local training program; report and feedback relevant information to other relevant stakeholders; integrate relevant information and insights into the operations plan of the Australian egg industry's Skills and Knowledge Development Program.

Based on the specific needs identified in this section, a set of questions was developed to aid the interviews and discussion. These questions were used to guide discussion during the International Experience and can be found in Appendix A.

6. The International Experience

After an analysis of the local challenges, the focus of the Fellowship was to learn from other countries how these challenges were addressed in other leading industries. Three key criteria were used to select the destinations. First the size of the industry and per capita egg consumption that is an indicator of the capacity of the industry. Second, a decision to prioritise English speaking industries was made to optimise communication time and potential expense of employing a translator for meetings and any resources identified. This decision was not made lightly because it may have risked the greatest potential for insight and learning; it might be expected that greater differences in skills development could be identified within industries with different cultures and languages. Last, there was a limit on the time available to undertake the international experience. Not all industries and locations could be visited in the time available.

The international travel program provided a remarkable and informative experience. It far exceeded expectations and the welcome provided by international colleagues was extremely generous. The following section provides key insights into the places and people involved in this experience, which have been summarised here to facilitate dissemination.

Although the main aim was to identify key resources and delivery models, the discussions and insights gained from meeting the people on this mission provided far greater insight into effective training than expected. This insight is difficult to capture or express in writing, but it was clear that the examples of good skills development were a combination of resource availability, expert delivery and most critically, the learning and working environment. Not the 'class room' per se, but the acceptance and integration of skills development within the workplace. In essence, a 'training culture' was characterised where a number of critical components are harmonised. The following summary will draw out the key components from the various discussions, examples and insights obtained.

6. The International Experience

6.1 Destination: Atlanta and Athens, Georgia, US

Purpose

The purpose of visiting Georgia was to attend a meeting of the United Egg Producers, visit the U.S. Poultry & Egg Association and the University of Georgia. This visit had two main aims. First, to make contact with the two key US egg industry organisations and peak bodies as this was important to explore and further understand the industry structure, workforce development activities and insights regarding the capacity of training.

Second, two extension experts (Drs Czarick and Fairchild) have been involved in Australian training events (although focussed mainly on topics in the chicken meat industry), which provided a basis to begin the international investigation. To this end, the main question was, “What makes these skills available in the US (and not Australia)?”

Key Contacts

- Mr Paul W. Pressley, Jr. Executive Vice President-Industry Programs,
- U.S. Poultry and Egg Association, Georgia
- Mr Chad Gregory, President and CEO, United Egg Producers, Georgia
- Dr Michael Czarick III, Extension Engineer, College of Agricultural Environmental Sciences, Department of Poultry Science, the University of Georgia
- Dr Brian Fairchild, Associate Professor, College of Agricultural Environmental, Sciences, Department of Poultry Science, the University of Georgia

Outcomes

Understanding the extension network

It was immediately clear why such extension skills need to be imported into Australia. The extension network in the US is outstanding, based on the structure and funding commitments that began following formation of ‘land grant universities’. It was clear that the strong emphasis on extension, bridging producer needs with research, enabled a clear understanding of industry need. The mechanism and culture behind this enabled the capacity and capability to be sustained to meet industry needs. The delivery of information was reportedly via workshops and direct contact with managers, rather than structured courses (Czarick, 2012).

The funding mechanism that makes this possible is worthy of further review. After the passing of the Morrill Land-Grant Acts of 1862 and 1890 (U.S. Code 2004a, b), federal land was made available to American states, to establish or fund (via the sale of the land) educational institutions focused on the profession and technical development of skills within agriculture and mechanical arts (without excluding other scientific and classical disciplines) (Cornell, 2012). These institutions became known the land grant universities.

Further development of the land grant education institution provided for an integrated extension and delivery system. Soon after the land grant universities were established, further funding was made available for agriculture and veterinary research stations, which were to be governed by the land grant universities. The Smith Lever Act of 1914 (U.S. Code 2004c) then enabled the development of the cooperative extension network whereby land grant university personnel can be stationed in almost every county in every American state to facilitate the local delivery of extension and training. This is a

6. The International Experience

system that empowers the development of specialist agriculture research facilities to meet the needs of local industry. Critically, the system continues to be resourced, with a 2013 financial year budget in the order of US\$1.24 billion (Cornerstone Report, 2012).

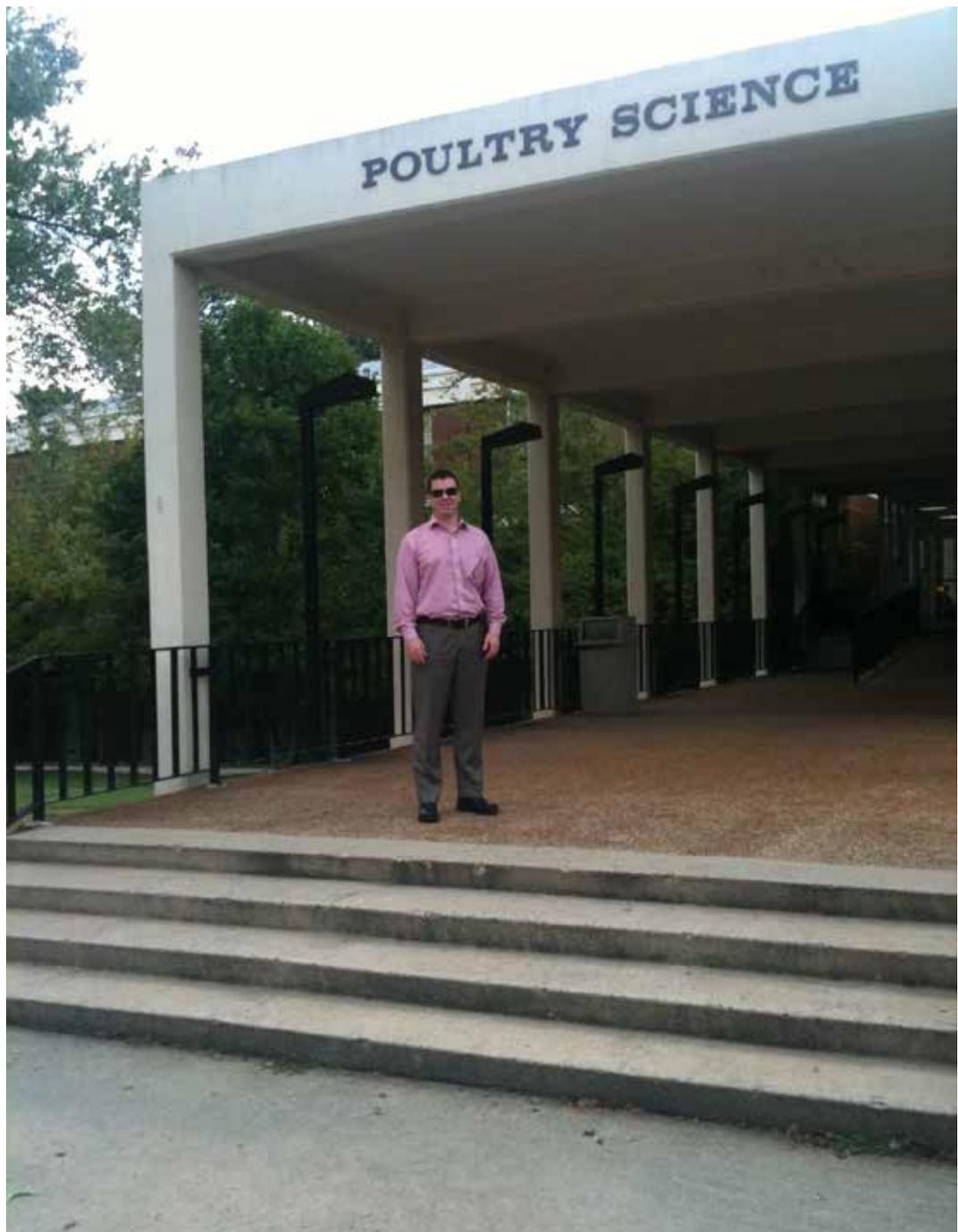


Figure 1: The Fellow outside an entire school focused on 'Poultry'; reportedly a 'dying breed' with only four dedicated poultry science faculties remaining in the US.

6. The International Experience

US Egg Industry Snapshot

It was revealed that a structured training program, with respect to a nationally recognised skills development and career program, is not a feature of the US egg industry. The industry primarily houses hens in conventional cages, with only about five per cent of production in non-cage systems (UEP, 2012). This system, whilst restricting some hen behaviour, optimises the feed and water delivery to hens as well maintaining a healthier flock. As a consequence, the on-farm skills required are minimised because less people can manage much larger flocks. The key skills required to run these systems are obtained from graduates of veterinary medicine and nutrition. Further, much of the 'unskilled' labour required to work within sheds was reportedly sourced from new immigrants from Mexico. On-farm training was usually conducted in-house to the requirements of each company (Baker, 2012).

From brief discussions with producers attending the Area '5' UEP Meeting, there wasn't a strong sense of labour shortage with the US industry, as workers could always be found and developed in-house to meet enterprise requirements. A common theme that emerged from the Fellowship was that employers liked word-of-mouth advertising and recommendations from existing employees for new workers. This seemed to be a surrogate 'aptitude' or 'culture' filter to select workers with the greatest chance of staying longer than six months to a year.

In summary, many of the external challenges are similar in the US industry as for our Australian industry. It was stated at the UEP Area '5' meeting that it is tougher to run egg businesses now with increasing external pressure regarding welfare, environment, food safety and associated regulation (Gregory, 2012). All of these issues indicate a greater need for skills development and good systems in the supply chain.

Delivery of skills to the industry

The results of this system were clear with respect to the development of specialist research and technical delivery centres. The model for delivery of expertise and skills to the US egg industry is centred round the well-developed extension network. Key challenges or new research information is delivered directly to farm managers or technical consultants in a workshop style or through direct interaction with the personnel in the extension system. Information is then transferred to the farm staff attendee and according to the needs of the enterprise.

This appears to work well for the US egg industry because the extension system is extensive and accessible to all producers. The county representatives, linked to the local land grant university, are responsible for maintaining industry linkages. This means that industry or enterprise needs are rapidly addressed and there is limited travel time to access information. For this system to work there the 'train-the-trainer' process must be functioning well.

Specific findings and resources

The Fellowship visit resulted in the direct access to the following key resources relevant to the Australian egg industry and the aims of the Fellowship: Your Future is now: Careers in the Poultry and Egg Industries (USPEA 2010a); Poultry and Egg Production Curriculum: A resource for High School Agricultural Educators (USPEA 2010b); and Single Vehicle Rollovers Driver Awareness Program (USPEA 2008).

6. The International Experience

6.2 Destination: Pennsylvania State University, Pennsylvania, US

Purpose

State College, the name of the college town that is home to Pennsylvania State University, more commonly referred to as 'Penn State', was identified because of key poultry activities being conducted there. These activities include the Pennsylvania Egg Quality Assurance Program and the Poultry Education and Research Center, all administrated via the Department of Animal Science within the College of Agricultural Sciences. The aim of the visit was to understand more about the training and extension models, particularly with regard to delivery. The visit also presented the opportunity to participate in an advisory meeting involving local egg producers.

Key Contacts

- Dr Paul H. Patterson, Professor of Poultry Science, Department of Animal Science, Pennsylvania State University
- Dr Terry D. Etherton, Department Head, Distinguished Professor of Animal Nutrition, Department of Animal Science, Pennsylvania State University

Outcomes

The visit to Penn State further established the understanding of the US co-operative extension system. Although the university had recently restructured, removing the fourth last dedicated 'poultry faculty' from the US, the experts were still able to undertake industry focused activities within larger, Animal Science department.

The poultry education and research centre was a terrific example of a practical research and training facility. The facility is comprised of a number of integrated sheds covering all key poultry disciplines, including a small chicken meat processing facility. The site undertakes research experiments as well as training senior students. These students (six to ten per annum, typically live onsite and are responsible for running the centre for their final year whilst they specialise in poultry studies) are highly sought after in the industry after they graduate (Patterson, 2012). These graduates fulfil the main capacity requirements of industry, which in turn develops a strong alumni culture.



Figure 2

6. The International Experience



Figure 3

High quality facilities of the Poultry Education and Research Center at Penn State

Graduates are in very high demand in the local poultry industry, providing a very strong Alumni Association. An experimental trial (Figure 3) reviewing the applicability of a fast growing vegetation to scrub air from poultry sheds was being undertaken; the vegetation will then be combusted and used to provide energy and heat for the shed.

It was obvious that the structure of the egg industry was different in Pennsylvania than in southern or Midwest states. The farm sizes were smaller, with many family owned and operated facilities. It was also interesting to learn that there was a lot of interest in the extension and training service from smaller farms, owner operated, indicating that practical skills development was more relevant to this sector of the industry (Patterson, 2012). The production in the state of Pennsylvania seemed to reflect production in Australia with respect to the amount of hens in production and typically smaller family owned and operated farms.

The visit to Penn State also included a day with the Penn State University Egg Industry Advisory Committee, one of the key organisations that land grant universities seek insight and feedback from their local industry. The meeting covered proposed activities for the year ahead and sought insight and feedback from the group.

The participation at the meeting provided the opportunity to talk to egg producers. It was indicated that within their family owned and operated enterprises most of the skills were in-house and passed on without a structured or formal training process. Skills such as vaccination and beak trimming were delivered by an external crew vaccination or rarely required for beak trimming because of the production system and infrared treatment at the hatchery. One of the other issues discussed was spent hen removal and processing and it was indicated that external crews and markets exist for this services. This appeared to be a similar situation to Australia ten years ago; however structural changes in the Australian industry (being the motivation for the discussion) have led to skills challenges

6. The International Experience

in this area in the Australian industry. Although it was promising to establish similarities between our respective industries, no significant insights were gained. If producers in the US are similar to those in Australia with respect to trusting strangers with production information, it may have been expecting too much to uncover greater insights from producers during a fleeting visit.

Key findings

'Outreach' programs are very popular with producers; these include targets skills development. The format is short courses (one to two days) focused on key husbandry or skills required for production.

6. The International Experience

6.3 Destination: Hy-Line International, Dallas Center, Iowa, US

Purpose

Hy-Line International, a global leader in layer hen genetic stock, is located in Dallas Center, near Des Moines, Iowa. Hy-Line Australia, a locally owned organisation and the market leader in Australia, own the rights to source genetic stock from Hy-Line International and import these genetics. The Fellow was fortunate to receive an introduction to Hy-Line International from Hy-Line Australia.

Hy-Line International runs a technical school (tech school). In 2012, 130 students from 60 countries travelled to Des Moines to participate (Ehr, 2012). To this end, the purpose of the visit was to meet the trainers of the program and learn more about the course and identify resources or synergies for our local training program.

Key Contacts

- Mr Jerry Dreyer, International Marketing Manager
- Dr Kenton Kreager, Senior Technical Service Veterinarian
- Dr Ian Rubinoff, Technical Services Veterinarian
- Dr Isa J. Ehr, Technical Sales Veterinarian
- Dr Travis Schaal, Technical Services Veterinarian

Outcomes

The visit to Hy-Line was one of the highlights of the Fellowship. The Hy-Line technical school is the metaphorical equivalent to a grand prix motorcycle manufacturer inviting the drivers and mechanics of racing teams from around the world to head office to learn how to ensure the best performance from their bikes. This type of opportunity gives users of Hy-Line genetics access to the experts, who have a keen interest in ensuring producers get the best performance possible. The observation of this engagement provides an insight to a shared 'culture of improvement'. The opportunity to meet the expert Hy-Line team and discuss the technical school and other egg production topics was extraordinary.

This outcome of the visit reinforced the importance of keeping the breed standard as an integral component of our local courses. Although the standards already feature strongly, it was logical following the visit to Hy-Line to review the links and available resources to provide the most relevant materials to students. This principle would apply to the three major genetics available in Australia to ensure all students are provided with materials related to the genetics they use.

Another key outcome was the possibility of having experts from Hy-Line offer to present at our training courses in Australia. This exceeds a key aim of Fellowship, providing input beyond access to written resources relevant to egg production. The opportunity to have world experts in hen genetics present to Australian students is an exciting possibility.

Above all, the welcome and hospitality provided by the Hy-Line International team provided a sense of collaboration and network that could be called on again. The Fellow looks forward to this occurring before too long.

6. The International Experience

Summary of key features of the Hy-Line Technical School:

- No prerequisite required, delivered in layman's terminology (translated into five languages)
- Discussion and follow-up provided for specific needs or topics
- Practical models for risk management, for example costs of vaccination
- Problem solving and continuous improvement reinforced
- Troubleshooting skills
- Practical post mortem and laboratory tour
- Biosecurity, theoretical and practical vaccination training, lighting program and general management
- The technical school is supported by regional lectures and schools, technical bulletins, newsletters and the support website
- The 'Red Book', a consolidation of management techniques is being prepared for more detailed on-line access (Kreager, 2012).

The above features focus on the skills development. The trainers are primarily involved in providing technical support to Hy-Line customers, which is a related activity and why they are experts. Participants of the technical school receive a certificate of participation.

When asked about the effectiveness of the technical schools with respect to skills development, all of the experts commented that they either observe changes on-farm or practices from the tech school undertaken from the tech school being used.

A final but important observation was that the technical experts at Hy-Line all displayed a particular culture or 'fit'. The technical experts all exhibited similar traits including, highly intelligent, well-developed listening skills (not once was the Fellow 'spoken over'), assertive, keen to help, never patronising, patient and ultimately, very easy to be around. On reflection, it would seem that these types of personality traits are ideally suited to those who assist producers manage underperforming flocks, when the problems are unlikely to be with the genetic product. It follows that they are also good very good traits for trainers to possess.



Figure 4: Reviewing egg skewers (marketed egg categories on shelf) at a local Des Moines supermarket with Dr Isa Eha, Hy-Line (on left)

6. The International Experience



Figure 5: The molecular biology lab at Hy-Line, the largest and as well-equipped as any poultry genetics company, with Amy McCarron and Heather Hooper (on right).

Genetic characterisation provides superior measurement and monitoring of traits, an example of how advances in technology provide superior capability with respect to optimising flock performance. Husbandry and management skills on-farm must be such to incorporate genetic optimisation to ensure the genetic potential is reached in production.

6. The International Experience

6.4 Destination: Iowa State University, Ames, Iowa, US

Objectives

The Egg Industry Centre, based at Iowa State University (a land grant university), appeared to be a pivotal information hub focused on egg production. The main objective of the visit was to learn more about the centre and the engagement with producers. The training focus of this visit was to explore the linkages between research and skills development on-farm, which is a key driver for the training program in Australia.

Key Contacts

- Dr Hongwei Xin, Professor and Associate Chair for Research, Director, Egg Industry Center, Iowa State University
- Mr Maro Ibarburu, Program Manager, Business Analyst, Egg Industry Center, Iowa State University

Outcomes

Another visit to a land grant university (the third and final for this Fellowship) and another terrific example of the effectiveness of the extension model with respect to industry engagement. The visit to Iowa State provided a strong example of industry support of a university centre. The centre operations, coordination and communication, is funded by significant industry contribution, partnered with the university which provides the staff and offices. The most striking aspect of the arrangement was the passion the researchers had for the egg industry.

The centre acts as leader and coordinated activities within other universities and the USDA; similar to the National R, D & E strategies in Australia (DAFF, 2012). To this end, a key extension and training activity is an annual Egg Industry Issues Forum that attracts approximately 120-150 egg producers. The topics are focused on the needs of egg producers and reports on new housing systems, food safety and managing risk in changing feed prices (The forum provides a key link to research and training, as the topics directly meet on-farm needs. Not dissimilar to the local Australia model, it appeared to be more effective because of the scale of funding and the number of people involved. The aim of the forum is also to identify needs of the industry; this is a function not covered in the same way here in Australia.

The other key activity of the centre is the specialist communication role it plays within the national industry. Regular updates are provided to inform industry on market factors including feed prices, cost of production and projections of the flock size.

The main mission of the centre is to “add value to the egg industry by facilitating research and learning for egg producers, processors and consumers through national and international collaboration” (Iowa State, 2012). Whilst this supports skills training it is more focused on applied research and facilitation. An interesting course that is offered is a short course to law students regarding agriculture production. With the apparent divide between ‘city versus country’ and the dis-association of food from agriculture in supermarkets, this would appear a good strategic course for the industry; more so with the recent rise in ‘legal’ based advocacy groups defending animal rights (Voiceless, 2013).

To counteract the negative arguments regarding the egg industry, it is training and skills and knowledge development that is likely to improve animal welfare outcomes more than production systems.

6. The International Experience

6.5 Destination: Guelph, Lyn and Ottawa, Canada

Objectives

Visiting representatives from a number of organisations within the Canadian egg industry including, the Poultry Industry Council (PIC), Egg Farmers of Ontario, Canadian Egg Farmers Association, the Canadian Poultry Research Council (CPRC) and the University of Guelph, was appealing for two key reasons. First, the size of the industry is comparable to Australia with respect to number of hens and geographic size. Second, the industry is supply regulated. This is now a unique feature of egg industries globally. It means that the volume and price of eggs is set by a control board that conducts a producer survey every three years to review costs of production (Pelissero, 2012). The hypothesis was that training, which generally adds additional costs to a business, would be more readily available as these costs could easily be met within a regulated market.

The structure of the industry was also similar to Australia, with respect to a larger percentage of smaller farms (5,000 to 50,000 birds), than compared to the US industry. Due to this similarity, it was important to better understand how the training and extension system services this industry. A final objective was to review the research work being undertaken at the University of Guelph on a number of studies pertaining to cage free production systems.

Key Contacts

- Mr Harry Pelissero, General Manager, Egg Farmers Ontario
- Dr Tina Widowski, Professor, the University of Guelph
- Dr Helen Anne Hudson, Burnbrae Farms
- Dr Bruce Roberts, Executive Director, Canadian Poultry Research Council
- Ms Jennifer M. Gardner, Animal Care and Research Coordinator,
- Chicken Farmers of Canada

Outcomes

The visit to the Canadian industry contained a series of positive interactions. This section summarises the key outcomes of the entire visit, rather than a more focused description of each location. The main reason for this approach is that although there was keen interest and good discussions, there was limited amount of insight that could be imported to our local training program. The industry is in the process of developing training across a number of key areas indicating the potential for good interaction in the future.

Apart from further establishing a number of good contacts, the other key insight related to the introduction of furnished cages. The new system was the feature of experimental trials of furnished cages being run by Professor Tina Widowski (University of Guelph). This was extremely interesting as the research being carried was preliminary work to understand the behaviour of hens, with respect to welfare. During the Fellowship there was a lot of focus and discussion on furnished cages and aviary systems and there are management considerations to consider when changing production systems because if new systems are not well run, there can be greater negative welfare implications for hens than intended. The images below show examples of the experimental work that must be undertaken before skills development can take place. Figure 7 shows a rearing system that is training hens to jump and move within aviary systems (note the adjustable hanging platform that is raised incrementally as birds grow to extend their ability to navigate large heights). This work is designed to address the

6. The International Experience

incidence of bone breakages as a result of a hen's poor navigation of heights, which is a feature of many cage free systems (Widowski, 2012). Figure 8 shows a new experimental colony cage being built to undertake research to assess welfare of furnishes in cages. The information from these trials will be published in due course. It is expected that the information will be extremely reliable and useful to inform Australian producers in future if these systems become popular in Australia.



Figure 6: A rearing system that teaches birds to navigate increasingly larger heights in preparation for aviary or outdoor production systems. A hanging platform is can be seen left of image that is raised higher as birds grow to extend and condition their 'jumping' ability.



Figure 7: An experimental furnished cage system being built to better characterise and understand the welfare implications of these new systems. Note the ramp to aide access to higher nest areas. Hens must be able navigate such heights safely (sometimes without the aid of a ramp) for optimum wellbeing.

6. The International Experience

There was considerable interest to maintain interaction and explore collaboration in future. This was evident from good discussions with industry bodies, including the Egg Farmers of Ontario, Canadian Egg Farmers Assoc. and the CPRC. Although these industry body generally cover a number of species (turkeys, chicken meat and laying hens), similar challenges to training were raised and discussed.

En-route from to Ottawa from Guelph, the Fellowship included a farm visit to Burnbrae Farms, Lyn facility. This was an interesting farm visit, hosted by a keen advocate of research and training with the Canadian egg industry, Dr Helen Hudson. Dr Hudson, a member of the family management team of Burnbrea, provided an engaging tour and discussion.

Feedback from discussions on key topics of this Fellowship provided an interesting insight into overcoming skills required for vaccination, beak trimming and shed clean-out and wash-down. Burnbrea have a dedicated team that undertake these tasks across the various production sites. This is a solution that larger operations in Australia should consider, or perhaps even a co-operative of smaller producers might facilitate. The benefit is that the team that generally deals with the toughest jobs in egg production is grounded by the company culture and quality expectations and training needs can be met. In Australia, it is sometimes remarked that the only people who can be found to undertake some of these tasks are those who have arrived from gaol or are expected to be in gaol before too long. It is exceedingly difficult work and apparently more difficult to find people to do it well.

The remarkable insight with a dedicated team was that they had a very strong, self-governing, culture. The members of this crew had pride in the 'toughness' of their role and those who didn't 'pull their weight' were not employed. The team were well esteemed by the organisation and were in high demand. The model is good in that it provides recognition within a larger organisation of the importance of the tasks, rather than as an external contractor with casual or temporary staff, being called in to do the 'dirty work'. The detailed reasons for why this works for Burnbrae would be well worth following up in more detail; it is clearly related to a strong culture of skills recognition.

6. The International Experience

6.6 Destination: AgITO and Egg Producers Federation of New Zealand (Inc.), Wellington and Auckland, New Zealand

Objectives

During the review stage of the Fellowship, the structure of skills development in New Zealand was identified to be similar to Australia. In New Zealand the qualifications are structured from Level 2 through to Diploma, whereas in Australia we have Certificate II through to Diploma, although the skills benchmarks are equivalent. AgITO is one of New Zealand's largest industry training organisations. They offer nationally recognised, NZQA qualifications in industry sectors ranging from dairy, to sheep and cattle, rural servicing, pork, poultry, wool harvesting and water industry services. AgITO contracts accredited training providers who deliver courses and monitor the quality of training and assessment, both on and off the job. The review (web and from word-of-mouth) indicated that there was some good resource material for egg production being used in New Zealand. To this end, the main objective was to meet the people involved in the development and delivery of training and review the possibility for closer collaboration.

Key Contacts

- Mr Marcus Weight, Adviser for Poultry, AgITO, Wellington, NZ
- Mr Michael Brooks, CEO, Egg Producers Federation of New Zealand (Inc.), New Zealand Feed Manufacturers Association Inc., Poultry Industry Association of New Zealand

Outcomes

The first outcome from the visit to AgITO validated the similar structure of qualifications in New Zealand as Australia. Quality controls for qualifications are maintained by the New Zealand Qualifications Authority (NZQA 2013). This was promising as it indicated that course materials, if available, may fit well into our local programs with minimal revision. The differences in qualification structure appeared mainly to be by label, for example rather than 'Certificate', the term 'Level' was used. For poultry 'Level II' was a foundation course, designed for all employees. The on-farm husbandry and technical focus is provided in Level 3 and 4 courses, which cover topics such as feed efficiency, feed formulation and nutrition. These courses were aimed at workers not requiring direct supervision and those progressing to farm management, similar to Certificates III and IV in Australia.

Government financial support in NZ for training was similar to the current National Work Force Development fund, with approximately a third (30 per cent) of the funds supplied by industry. It appeared that the costs of course delivery were lower than in Australia, making training more affordable for the New Zealand poultry industry (DIICSRT, 2013). For example, the industry cost for a Level 2 course was \$NZ270, which means the total costs were \$900. In Australia it is unlikely that a Certificate II course could be delivered for less than \$A2000-4000, depending on the mode of delivery and the size of the cohort.

Even with relatively affordable training, there were difficulties reported engaging some participants. The most challenging sector was reported to be the smaller egg production enterprises. This was not surprising as our local training program has observed similar barriers. The main problem is that the time off-farm needs to be covered and some producers are too busy running the business to participate. At this juncture, discussions then lead to potential use of remote training resources, such as on-line delivery. A good outcome of this discussion was the identification of the possibility that such resources could be jointly developed.

6. The International Experience

Due to the close location and similar production practices, there seemed to be very good opportunities for sharing of training experiences and goals. This directly met the aim of the Fellowship, which was to build a network to aid collaboration. Further success of the visit was the potential to access resources to adapt locally and possibly develop an online resource that could be used in both industries. Specifically, these resources cover induction training in egg grading, which may also benefit quality assurance programs. At the time of writing, confidentiality agreements were being exchanged to progress the collaboration. After detailed review of the resources (see Figure 9), it is envisaged that a suitable licence agreement and joint development project would be developed. In summary, this is a very positive and significant outcome of the Fellowship.

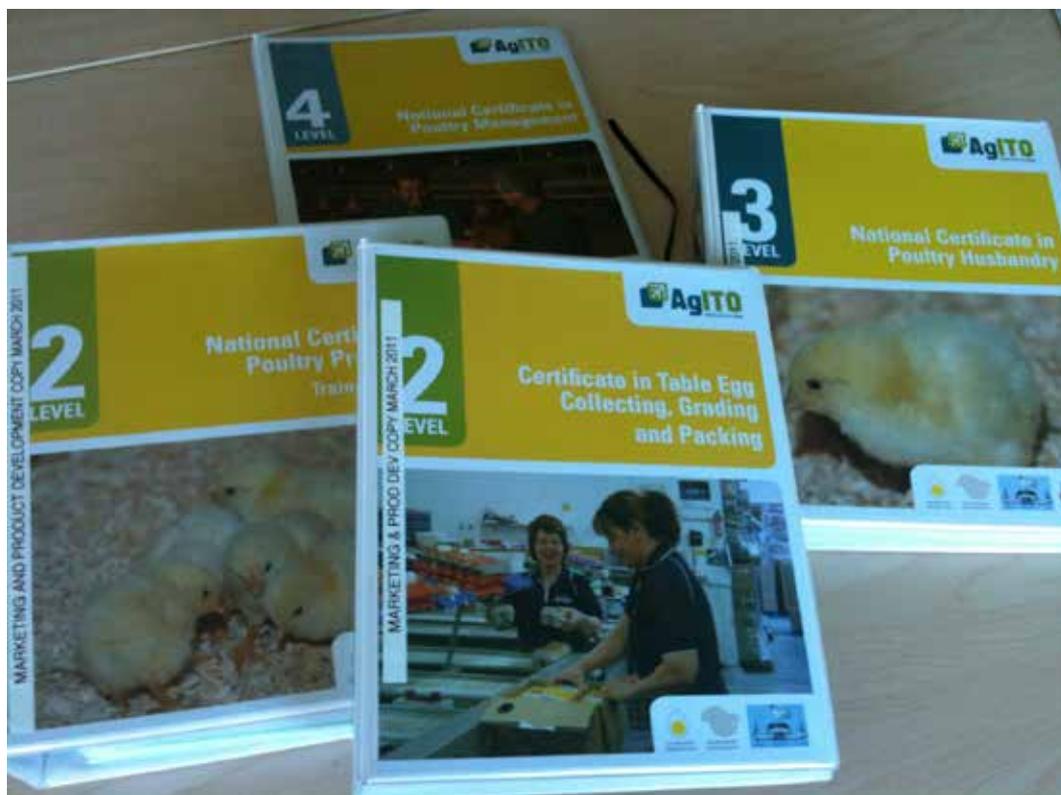


Figure 8: Images of the AgITO poultry industry resources showing some topics and skill levels. The potential for further collaboration in development of resources, particularly for an on-line format, was an outcome of the Fellowship.

On reflection during the reporting process, a further outcome from the NZ visit was identified. This relates to some discussion at AgITO, but mainly from the industry association, about new colony cage systems being introduced into NZ. Colony cages, that are popular in some parts of Europe due to changes in legislation, are larger cages that provide furnishings such as nest boxes, perches and scratch material for birds to express more behaviours than in a conventional cage. Most welfare research indicates that the management of systems is more important than the system itself with respect to the welfare. Therefore, if new systems are to be introduced into Australia, it would be prudent to have a robust and specific skills development program in place to minimise the risks to welfare during any transition phase.

6. The International Experience

6.7 Destination: Harper Adams University College, Newport, Shropshire, UK

Contact

- Dr Graham Scott, Senior Lecturer

Objectives

The key objective from the visit to Harper Adams University was to learn about the specialist egg programs that are advertised and to meet the course developer and coordinator. Being the first visit to a UK training facility, it was also important to gain general insights into training and how challenges are met. As always, the key focus was on effectiveness of delivery and identifying key resources.

Outcomes

Harper Adams is a leading university college that provides specialist higher education for the agri-food chain and rural sector. It is not a large organisation with only around 4000 students and 2500 of this cohort are studying at the undergraduate level. The history of Harper Adams is interesting in the context of this Fellowship.

Harper Adams started in 1901 following a substantial bequeath (from Thomas Harper Adams). The early focus was on practical skills development with certificates on offer as well as more scientific diploma courses, which were not as popular as they were considered too theoretical. The College has a long history of training in poultry production. A specialist poultry husbandry department was created in 1909, with egg laying trials beginning in 1912. These activities provided Harper Adams with a large following. The strength of the poultry expertise at Harper Adams helped see the College survive following the agricultural depression of the 1920s and 1930s. Harper Adams established the National Poultry Council in 1920 that encouraged national development of the poultry industry. In 1926 the National Institute of Poultry Husbandry was established as a leader poultry education.

In the 1960s, a third of all students were studying poultry courses; however, the structure of the industry changed and more workers were being trained in-house, reducing the demand. By 1991, the poultry teaching was transferred to the Animal Department.

Interestingly, this change in demand correlates with Harper Adams' move towards degree (courses starting in 1986) and research programs (first PhD conferred in 1989). This change was in part the result of government funding increasing in the tertiary sector, but at the same time limiting the financial freedom, requiring tertiary institutions to generate revenue. Therefore, student numbers had to increase to cover the administrative costs. This recent history does not seem dissimilar to the history of Australia's tertiary sector, when in the late 1980s many skills focused technical colleges were amalgamated and became universities. It is generally understood that the more theoretical a program, or the less practical, the less it costs to deliver. Training costs are even lower when a class room or a training/ demonstration/ research farm is not required, such as with e-learning. The main point is that it appears changes in the course or program were the direct result of government funding, not necessarily the needs of prospective student, or even sound financial planning, including market audits, regarding the latter to address pending changes in government funding.

It may not come as a surprise that Harper Adams no longer provides a practical certificate course for egg producers. Although a course was recently developed and approved to rigorous quality benchmarks (Scott, 2012) the administrative risks were considered too high to offer the course; in part due to the limited poultry capacity now available at Harper Adams, certainly an ironic situation

6. The International Experience

based on the history of Harper Adams. This of course was source of great frustration (and confusion/bewilderment) for the course developer, but provided a serendipitous opportunity for this Fellowship. All the course development materials, including course plans, notes and assessment materials were offered because they were not needed and “perhaps could be put to some use”. This offer was a true character insight and genuine gesture of good will, which was also evident from the humorous or anecdotal retelling of the most recent chapter of Harper Adams’ poultry skills training history, which actually didn’t seem to be a positive chapter of the story.

The other key outcome of the visit to Harper Adams was direct access to a recent review of e-learning in skills development. The key contact, Dr Graham Scott, was a relatively recent recipient of the Temperton Fellowship. This was a pivotal piece of work that provides terrific insight for our local industry and the move towards a remote delivery model is being discussed and potentially developed. The driver of this move is two-fold: first because of the costs of hosting face-to-face training workshops including the time-off farm for attendees; second, is the aim that more producers might access and engage in training if it is made more flexible. The report also reviews the concepts of ‘open learning’ or ‘life-long learning’ that suggest a less structured approach to formal education (with respect to timing of completion) but more directly meet the needs of workers as they progress within a career. This aspect will be discussed in more detail below, as the concept has strong benefits for industry. However, there are significant challenges if an e-learning ‘revolution’ is to be made and sustained. Our local situation needs to be reviewed in more detail, to ensure provision meet needs directly, before finalising distance learning plans locally (Stewart, 2012).

In summary, the interaction with Dr Scott was very insightful and enjoyable. A good robust discussion about the modern egg industry and how to provide training support was had (along with a very decent cup of tea!). A number of key insights into skills development were obtained from a passionate expert within the discipline. At the end of the visit, a good contact was made to be built on in future, which directly aligns with one of the aims of the Fellowship to building an international network.

6. The International Experience

6.8 Destination: Reaseheath College, Nantwich, Cheshire, UK

Objectives

To better understand the network of training and coordination. The College does not run egg training courses directly, but it was identified during preliminary communication that they obtain funding and coordinate training (included egg production courses) across a number of colleges and centres. A secondary aim was gain more insight into the UK training system and structure.

It was also revealed that the College runs a small bioreactor, which uses the effluent from the College farm to generate electrical energy and heat. This type of the technology is discussed often in Australia, after following the Carbon Farm Initiative following the Government's announcement of Carbon tax and future trading schemes. If such energy re-use projects are to be used, it will be important to consider the skills required for efficient operation.

Key Contacts

- Ms Emily Welch, RDPE Skills Programme Administrator
- Mr Sam Grundy, Farm Demonstrator and Coordinator

Outcomes

Although Reaseheath College does not run egg production training directly, it is involved in obtaining funding from government grants and using the funds to deliver training via other institutions and trainers. This seemed odd at first, but after discussion it appeared to be an effective mechanism to obtain funds from government and use them to assist regional producers increase knowledge and skills in areas that met the needs assessment of the fund grants. The College made effective use of administrative co-ordination resources and could identify training needs through a good understanding of the local industry needs.

The detail of the funding mechanisms was not explored in detail because the limited time available. The main outcome of the discussion was that the available funding does enable producers to get involved in training as courses were attended. If the funds were not available, it seemed unlikely that the College would be involved and facilitate the delivery of training.

The visit to Reaseheath inspired the concept of a 'skills training farm', perhaps a long-term goal or vision for our local program. Reaseheath College runs a very successful (commercially viable) farming business in beef genetics, dairying and pig production. A terrific tour was provided, with thanks to Mr Sam Grundy (farm manager), that provided an insight into a number of state of the art operations; all of these operations were primarily used for skills training and demonstration purposes. This is not something that is often observed in Australia, especially in the egg industry, but as a concept it may have value for addressing industry workforce issues.

In Australia, there are agricultural universities and departments, often with land and animals (for example UNE, UA, UWS, UQ, UM). However, the focus is on degree programs and research and often more specifically targeted towards veterinary science and training veterinary practitioners. The needs on Australian egg farms are more commonly for Certificate and Diploma trained students. An egg producer has commented to the Fellow that it takes approximately two years for graduate student to actually learn the skills required to care for hens and independently manage an egg production shed (May, 2011). Feedback from others in the industry indicates that training is no longer available from a number of the locations now administered by the organisations listed above, which correlates to the

6. The International Experience

structural changes mentioned in the previous section and changes in industry needs. Incidentally, this scenario of 'pieces' of a larger training network, now 'broken' was the motivation behind the title of this report. Changes to resourcing and administration of training facilities, together with structural changes in the industry (more intensive systems requiring fewer workers) has ultimately lead to the current scenario. Essentially, the provision of training in Australia is not aligned with the experience and skills of graduates required to meet the workforce requirements.

Tocal College (Paterson, NSW) provides an excellent local example of the type of training facility that could assist the egg industry training needs. The activity is summarised well on the Tocal College website (Tocal, 2013), "It (Tocal) provides a unique blend of agricultural training and practical experience for school leavers and other people who may be interested in rewarding careers in agriculture. Year 10, 11 or 12 school leavers gain a practical pathway to careers in agriculture or gain credit in a variety of university degrees. Tocal College also provides a diverse range of education products and services to farmers, landholders and rural industries".

This concept deserves greater study and review, which is beyond the scope of this report, in order to assess its viability for the egg industry.

Another feature of Reaseheath that was discussed during the site tour was the anaerobic digestion (AD) plant. The AD plant, that takes waste from the dairy and piggery as well as other sources from the production facilities, was established recently via a grant (North West Development Agency and Rural Development Programme for England). Figures 10, 11 and 12 below show a number of aspects and the scale of the bioreactor. The purpose of the reactor is to demonstrate the technology and expose future agricultural workers to the technology, considering the potential for such technologies to be more popular as energy costs increase (Farmers Guardian, 2011). Although the concept is valid, it was reported that the reactor is very difficult to operate and was not yet at full capacity because of the operational challenges (Grundy, 2012). Whilst the design and construction was straightforward, the follow up service has not met the needs of the College. It was reported that there is no readily available experience or literature to assist with the ongoing operation and management of the technology. This is somewhat due to the 'newness' of the technology; however, it was obvious that the addition of such technology is more than a simple add-on to a production system. If the technology is added to a farm, the operations need to be well planned with appropriate training and resources.



6. The International Experience



Figures 9, 10 & 11: Reaseheath College Bioreactor (anaerobic digestion plant) generating power and heat from a range of farm effluent streams (shown in Figure 9); a reactor chamber and the gas storage cylinder in Figures 10 and 11 respectively. Operational challenges have been experienced that strongly indicate that on-going support and training are critical to smooth integration.

6. The International Experience

6.9 Destination: Myerscough College, Bilsborrow, Lancashire, UK

Objectives

Myerscough College specialises in education and training for the land-based and sports industries. It offers further education courses for school leavers (16-18 year olds) and apprenticeships as well as degree programs. The main focus of the visit was to review the industry courses that are offered by the College. The practical “ready for the world of work” focus of the College naturally includes specialist short courses (over 200). One of the specialist courses being run by the College (but coordinated by Reaseheath College) was an eight week egg production course. The objective of the visit to Myerscough was to join a session of the production course and meet the participants and the presenter to gain greater insights into the training provided to egg producers attending the course. Other objectives included the exploration into training programs in the UK and to identify resources or systems that may be effective for the delivery of training in Australia

Key Contacts

- Ms Kathleen Lowe, Head of Rural Development
- Mr Robert Burrow, Agriculture & Rural Development Coordinator
- Dr Alastair Johnston, Poultry Specialist, Minster Veterinary Practice, York

Outcomes

Another highlight of the Fellowship was to attend a post mortem (PM) practical run at Myerscough College. The practical session was part of a longer training program, which with seven other three to four hour sessions a week, comprised the theory based course. As previously mentioned, the administration and funds for this course were being supplied by the Reaseheath College. When complete, the student receives a certificate of participation rather than any formal skill set or qualification.

The delivery of the PM session was very good. The key features included a very knowledgeable trainer (Dr Johnston), allowing the students to make their own observations and explorations following the instruction provided. The session was presented in a structured format and the class worked together to answer queries posed by the trainer throughout the exploration. The class were also invited to share their own experiences for class discussion. Most importantly, the session was focused on ‘what to do on-farm’, so the context was appropriate for the students. A number of photos were taken during the course, showing the engagement of the course participants (Figures 13 and 14). Afterwards, all the attendees questioned provided very positive feedback on the course. Interestingly, most class attendees were relatively new to the British egg industry, with small (ca.500 to 5,000 hen) free range holdings. There were two employees of Noble Foods, a large integrated egg production company and the topic of the next section. In total, the class contained about 15 people aged from 17 to close to 70.

6. The International Experience



Figures 12 & 13: Obvious passion and engagement during the post mortem practical session under the supervision of Dr Alastair Johnston (top right in Figure 12). Students were fascinated by the session as indicated by continual series of questions and discussion related to on-farm observations.



6. The International Experience

The visit to Myerscough also included a discussion about training provided by the College. There were many similarities with Australia noted such as the general structure of qualifications and some barriers to training in the region. Regarding the barriers to training, an interesting one was that it is difficult to engage the older generation with in training programs. To address this situation the College targets the younger generation (16-24) to initiate and engage them in training for the future. The idea, yet to be operational, is to provide foundation skills for their vocation and build a relationship for life-long learning. This strategy involves a 'professional points system' or passport, where students can build qualifications over time. This flexible approach works well for relatively time poor farm workers and managers. The approach offers the ability for students to choose topics relevant to them at the time without additional requirements to meet a qualification.

Another strategy of the College was to further enhance the online learning management systems. This involves making more courses available online and keeping record of a student's progress. There seems to be a lot of interest in the UK and Europe regarding remote/on-line learning systems. In fact, much of the vocational training was underpinned by government funds. For example, programs such as the rural development programs (NW region), Department of Environment, Food and Rural Affairs (DEFRA) and the national skills framework provide the funds to deliver training and run demonstration events and other extension activities (DEFRA, 2013; Livestock Northwest, 2013).

In summary, more good contacts were made and good insights were gained. This was evidenced by the follow up information sent after the visit, which included a recent report on training and extension activities.

6. The International Experience

6.10 Destination: Noble Foods Ltd, Lincolnshire, UK

Objectives

The site visit to Noble Foods was an opportunity to meet industry leaders in egg production and on-farm (supply chain) education and training programs. The key contacts also represented the greater UK egg industry within the Egg Producers Association. The aim was to explore the 'big picture' for the industry with respect to workforce development, availability of training programs and training from an industry perspective. Particular emphasis was on the use of e-learning, based on the learning from the previous Fellowship meetings.

Key Contacts

- Mr Andrew Jorêt, Group Technical Director, Noble Foods, Newark, Nottinghamshire
- Ms Nikki King, HR Manager, Noble Foods, North Scarle, Lincoln

Outcomes

The first impression at Noble Foods was very strong one with respect to the purpose of the visit. The site had a 15 minute induction package that was a combination of video and face-to-face information exchange (undertaken by the receptionist), outlining the hazardous and required safety guidelines. Although induction of visitors may be a legal requirement, or perhaps to offset OH&S insurance premiums, the quality of the activity gave the first insight into a strong training culture. The video was well made, high quality and not patronising. This combined with a trainer-receptionist who appeared to understand and believe in the importance of this short training event. More insights into the training culture at Noble were to follow.

Noble is the largest egg producer and marketer (buys and sells eggs) in the UK . It is a vertically integrated business employing approximately 1700 people in feed mills, farms, transport, egg packing and grading, egg processing (e.g. production of liquid egg) and food making. The network also extends to contract farms, from which eggs are purchased to meet the Noble market.

It appeared that Noble was a leader in training and had a strong relationship with an online training provider, Learning Nexus to develop and supply the modules required by the Noble team. Noble was required to pay a small fee per user in return. The fee seemed too low to be the only source of income to maintain this service. However, the Noble team indicated they were very pleased with the arrangement, as they could nominate and develop units as they required.

Noble have a series of compulsory and elective units available for staff depending on their roles and responsibilities. The topics cover the core operational aspects and focus on specific skills required by the role. Employees are encouraged to engage in continuous learning through performance reviews and roster scheduling that allows time for training. A purpose built training room is provided to overcome any technical issues and improve the accessibility (see Figures 15 and 16). The e-learning modules have a strong focus on interactivity and are supported by management with respect to practical skills development.

6. The International Experience

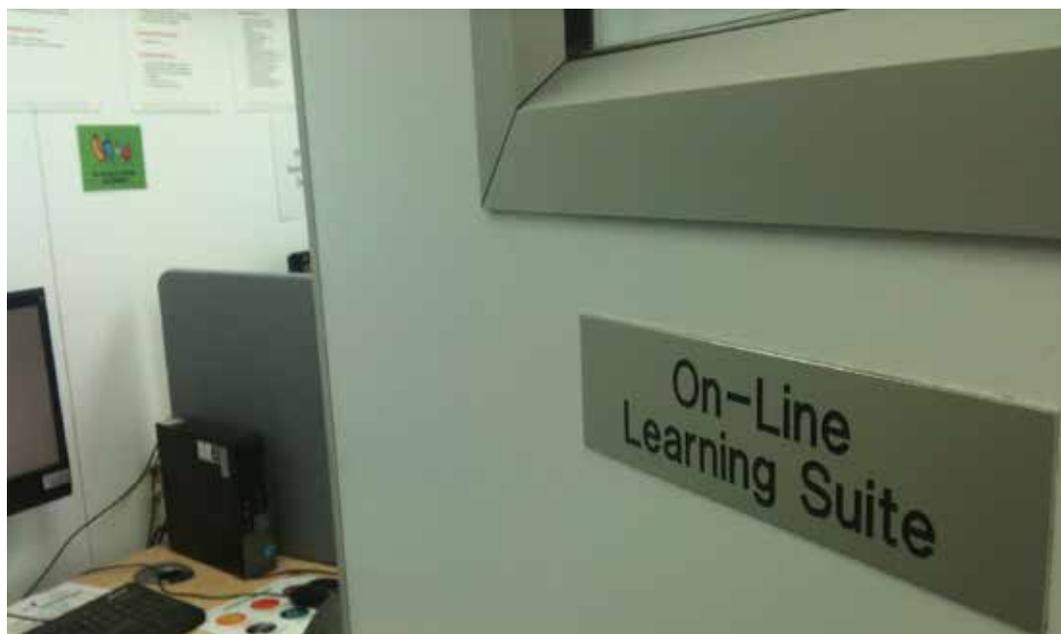


Figure 14: Impressive support of training and provision of facilities as evidenced by the dedicated on-line training facilities at Noble Foods Pty Ltd.



Figure 15: The Fellow getting firsthand experience of the adequately furnished and purpose built on-line training room. (The outfit is typical attire for visitors to reduce biosecurity risks when undertaking production site visits.)

6. The International Experience

Interestingly, the national qualification system (NVQ) does not directly meet the business needs of Noble operations and therefore is not generally supported. However, management and leadership training is provided by the Institute for Leadership and Management (<http://www.i-l-m.com/>) via Lincoln College (which provides a certification such as a diploma or degree). This was identified as important for succession planning and the skills required for farm managers (e.g. OH&S, time management, customer engagement, staff development). The core focus of training was for operational staff.

The main drivers of training at Noble were quality production and customer needs (namely large retailers). Training appeared to be accepted as a core operation to ensure new staff were inducted and existing staff were provided support to improve knowledge and skills. This process was to ensure quality operations and to reduce risks in production. To this end, key modules include food safety, OH&S and hen welfare. Training for food safety licences was provided via an independent system, with additional costs. The key to the system were those who understood and believed in the benefits of training to employees and the company; including those who provided the time to answer my questions and show me around the facilities.

7. Knowledge Transfer: Applying the Outcomes

There were two key characteristics of training in the egg industry that were identified prior to the Fellowship: access to relevant (modern and contextualised) training resources; and suitable delivery systems to reach a small yet highly geographically dispersed industry. This section summarises the key insights gained throughout the Fellowship, some of which indicates that our local program is travelling in a positive direction. It is important to note that some of the key learnings from the many good contacts made during the Fellowship came after the visit as new information and knowledge or perspectives were assimilated with existing knowledge. This reflective and constructionist learning experience for the Fellow was unexpected but made for a very fulfilling and rewarding Fellowship experience.

Extension systems and modern knowledge development

Insights from the extension system associated with the land grant universities show the importance of maintaining access to current technology and information regarding production. It is important to maintain practical research facilities; to ensure industry has up-to-date knowledge on the performance of new genetics, production systems, feed ingredients, or management approaches. The other aspect of the extension system is that there is good engagement with local producers to identify areas of need within industry.

It would be very difficult to establish such an extension system in Australia; in fact the trend of government support for extension is the opposite (Clarke, 2010). Two options to address this include: continuing to support the universities that have research facilities; and guide research projects towards delivering practical outcomes that can be used to develop industry skills.

Another option, to be considered as a long-term vision, is to establish a purpose built research and training farm that operates commercially and could manage industry extension and training activities, including short stay workshops, traineeships and apprenticeships. Although this may seem fanciful, the future may need to include such facilities to directly meet industry needs if all government funding and support for extension and training ceases. This concept was stimulated by the visits to Penn State, Reaseheath, Myerscough and Harper Adams, where a tradition of specialist knowledge and its dissemination seemed to add strength, importance and a reason for being or operating.

In the more immediate future, the industry's R&D program should aim to provide more tangible outcomes that can be used on-farm. The training program must also incorporate new knowledge and be kept up-to-date to maintain relevancy. This could be achieved via regular review and such a review will be added to the annual operations of the egg industry's training program.

High quality resource materials

There were some good insights and access to resources and the materials required to develop high quality resources. It is believed that access to the information and existing international resources such as from AgITO and Harper Adams, was only made available from the international experience of the Fellowship.

Equally as important as identifying appropriate resources, was the knowledge and network to access the information and experts required. To this end, the Fellowship provided direct access to Hy-Line International experts for management of genetics and the work being undertaken at the University of Guelph with respect to the new enriched cage systems.

Even though good insights and access to resources was achieved during the Fellowship, it is still important that materials and information are contextualised for the Australian situation. Without this review and refinement being undertaken, a trainer would risk losing the engagement of trainees. The information collected and made available during the Fellowship will be reviewed, developed and incorporated into our local programs over the next 12 months. This process is expected to establish greater links with the NZ industry as well because of the interest in co-developing on-line resources.

7. Knowledge Transfer: Applying the Outcomes

The experience also identified the need for our local industry to maintain observation of international developments in the new furnished cage system. It would be prudent to flag the possible development of a new 'furnished cage' skill set training course in preparation for the uptake of such systems locally. This skill set would cover the key topics to equip workers and producers to manage including: Workplace Health and Safety, Hen Welfare, Egg Production and Performance, Nutritional Aspects and Economics of the new systems. Ideally this course would be made available well in advance to ensure the industry is well prepared if such technology becomes popular in Australia.

Delivery, a key to successful training

There seems to be a strong, magnetic like shift toward 'on-line' or e-learning. Institutions that were involved in delivering e-learning spoke highly about it and those not involved were very interested in developing it. The main reason for the positive sentiment seemed to be because of flexibility and reduced cost. Trainees can theoretically work at a pace that suits them and do not necessarily need the time off farm to engage in training. The overheads of delivery are also potentially reduced as 'classrooms' and travel is not required. The geographical spread of the industry in Australia is a good example of where the benefits of 'remote' learning could be realised. The other advantage is that new students could start at any time, rather than have to wait for the next course to start. No insights were gathered from those exposed to e-learning during the Fellowship, which may help provide more guidance for the further development of e-learning in the Australian egg industry.

The other main message that was clear from the Fellowship was that without government funding, delivery of training would unlikely to take place. From all the observations made there was only one example of structured training being undertaken without the assistance from government funds. In fact, this was a concerning observation. Considering the benefits of training to an organisation, it seems incongruous that training is not more widespread among the regions visited. No doubt there are numerous examples of in-house or unstructured training (not aligned with a formal qualification or standard) being conducted in egg production businesses. However, similar industry challenges were identified in the areas visited with respect to finding and retaining 'good' employees. In theory, the development of staff via training can address such issues, as well as provide other benefits to the profitability of business, regardless of funding source.

Neither resources nor delivery related

As previously discussed, the focus of the Fellowship was to obtain insights regarding delivery and access to resource material. However, the Fellowship experience identified two other relevant insights that can be noted for potential application to our local program; the learning passport and training culture within an egg producing organisation.

The learning passport system aimed to recognise 'life-long learning' (Lowe, 2012). This was a strategy to engage young students (16-24) now and keep them engaged periodically throughout their agricultural career. The main idea is that good training experience early in their career would make them more willing to continue building their skills as they progress. In theory, this means that the challenge to engage the older generation would not be experienced to the same extent as it is experienced now. Another benefit is that employees have the flexibility to build a career across a number of different organisations and even industries supported by the recognition of a foundation qualification that can be built upon as new skills are required. This approach also recognises that the commitment to study a complete qualification is too high for many full time employees and provides flexibility to build units or skill sets over time. The main challenge in Australia would be to provide the skill sets or units as required and to align funding to support such a system. However, it is a concept that will be further reviewed within the egg industry to provide recognition of undertaking an industry endorsed course.

7. Knowledge Transfer: Applying the Outcomes

A very real, yet difficult to characterise, concept is that an organisation must have a positive 'training culture' to realise the greatest return from training. This means that employees are encouraged to apply their new found skills and ability to contribute to on-farm productivity. The opposite is that training is either not undertaken or when management becomes threatened by employees returning from training with 'too much' enthusiasm.

Such a culture is most difficult to characterise with respect to identifying the drivers required to develop an environment that encourages and embraces skills development. The 'million dollar question' is: Why is it that some organisations engage and realise the benefits of training while others simply do not engage? From the observation made it appears that a training culture appears to be closely linked to businesses focused on continuous improvement, i.e. actively seeking ways to improve performance. This in turn appears to drive a need for those engaged in 'the game' to have a deep understanding of the knowledge and practices of the systems of production. The ideal culture may also be associated with an understanding of 'why' tasks are undertaken, rather than simply following instructions. There seems also to be links to 'problem-solving' skills and the ability of an organisation to incorporate improvements into its ongoing practice. Even with further and more focused study, it is likely to be difficult to identify a precise recipe. It may well be the case that it is a mixture of these traits or 'ingredients' that result in the development of a positive training culture within an organisation.

Perhaps less mysterious, regarding a 'training culture', is that they invariably permeate throughout an entire organisation. This is evidence that there is a strong leadership aspect to the culture. If so, there may be a 'champion' within the organisation who can influence the strategic direction of the organisation. It may be possible to engage potential champions within the egg industry to encourage the development of robust training cultures across more organisations. This would involve the identification of key people to mentor and business drivers required to 'sell' the concept. This approach will be undertaken in our local program over the next 18 months as a pilot. It may be a very difficult aspect for a third party training program to influence and succeed in developing a training culture where it doesn't exist; however, a positive culture is critically important to realise the return-on-investment for industry skills development that it cannot be overlooked.

In summary, most of the findings and outcomes of the Fellowship are being utilised directly in the egg industry's training program. This is made possible via the Fellows' role in the program. There are current activities that utilise the new knowledge and information on a number of levels. Key activities include direct follow-up with resourcing and developing new courses with an on-line component. There are immediate inputs into the strategic direction of the training program that are being fed into new programs and applications. For example, the integration of remote learning and mentoring to assess and encourage the development of training cultures on-farm. In the longer term, it is expected that the contacts and networks will be further developed for more benefits. The key findings from this Fellowship provide a good foundation of information that can add to existing knowledge and shared with similar industries. The key messages will be to focus on industry needs and integrate extension into training, incorporate practical field based research and provide a clear path and support for long-term skills development.

8. Recommendations

Recommendations and actions arising from this Fellowship

In summary, the extension and training systems available to the egg industry (and other agricultural industries) have all but disappeared in the last two to three decades. A relatively new initiative of the Fellow, within his capacity at AECL, is attempting to re-establish a sustainable training service for egg producers and their employees. This Fellowship provided the opportunity to seek insights from international experts with respect to resources and delivery of skills to support best practice in egg production.

It will require a collaborative and multi-stakeholder effort to apply the outcomes from this Fellowship. The activity of improving the environment to develop the skills in the egg industry workforce should be a shared responsibility between the egg industry and government because of the mutual public-private benefits that are attainable from a skilled work force. Such benefits include the reliable delivery of a cost-effective protein and nutritious food source, economic and social benefits for an industry that is focused only on servicing the requirements of the Australian population, the efficient use of natural resources, managing biosecurity risk including zoonotic diseases such as avian influenza, managing workplace health and safety, improving efficiency of production to improve profit or affordability, and ensuring that the wellbeing of hens is enhanced.

The following points are intended to guide discussion and interaction for those people in the respective organisations who see the benefits in championing this cause of providing robust training systems and support for primary industries such as the Australian egg industry.

For those in Government – Federal, State, or Local

- Maintain funding opportunities for the benefit of the national workforce and workers in general to encourage the attainment of qualifications. Certified training only occurred with the support of government funding, indicating that the value of certified training was not as high as specific skills used on-farm. Therefore, Governments should continue this as part of the partnership.
- Ensure funding is directly linked to industry extension and contemporary practices, such as those in quality assurance programs.
- Funding should be available to update resources and materials to ensure contemporary contextualisation is undertaken.
- Review the possibilities for recognition of a lifelong learning or open learning opportunities, including greater flexibility in funding. Programs that have time limits for completion limits the ability of longer term study for better time management. This may be achieved through funding skills sets and building these over a longer period within a recognised 'skills passport' system.
- Support the development of new delivery models to ensure flexibility in the mode of delivery such as on-line and hybrid delivery models.
- Regularly review the economic benefits of skills development to allow more accurate prioritisation when policies and budgets are being determined. Such benefit cost information can also encourage industry involvement in training programs.

For those in Industry

- The best egg producing organisations appear to have training and skills development as an integral component of their business. All companies should consider the integration of skills development with their production systems. Key actions might include: making time for participation; rewarding and acknowledging completions; allowing new ideas from training to improve the systems and practices on farm; work to understand the benefits of training to the organisation.

8. Recommendations

- Develop a strong link between extension and training. Extension must produce relevant material and training can deliver information to industry. Skills and knowledge outcomes should be a focus for all research and development.
- Develop an 'egg industry training institute'. Consider the significant development of a training and research farm that could undertake research trials and house the industry's Skills, Knowledge and Extension operations. The institute would have to be a profitable operation and could be supported by research and training investments and incentives. The institute would be designed to meet most egg industry workforce development needs, across all levels of production.
- Make training more accessible to all of industry. This will require more flexible access and funding models, developed in partnership with industry. Focus on industry needs and linked to extension and quality assurance needs. Review future needs and regulatory requirements.
- Support the development of a robust and secure skills development and delivery team. This human resource is critical for building and strengthening the egg industry program.

Education and Training – University, TAFE, Schools

- It is critically important to ensure there is collaboration between industry and professional training and teaching organisations. The market is unlikely to be large enough to sustain many players in this field, as was observed in the past. Duplication of resource and efforts is an inefficient use of funding.

International Specialised Skills Institute

- Develop more activities to support the networking of Fellows in Australia. Consider an annual event, possibly linked to an Agrifood Skills conference or similar, that may also provide expert insights or short seminars for Fellows.

Concluding Comment

Although there is much conjecture regarding the meaning of the classic, and possibly the most well-known nursery rhyme in the English language, 'Humpty Dumpty', there is no argument that, "Humpty could not be put back together again". Or further, "make Humpty Dumpty where he was before", or "place Humpty Dumpty as he was before" or even "Couldn't put Humpty Dumpty to rights!", depending to which version of the nursery rhyme one subscribes to (Wikipedia, 2013). The same could be said for the old formats of training (and extension) that were once available to the egg industry; there is no returning to the original form.

In the context of this Fellowship and its recommendations, 'Fixing Humpty', or putting him back together, means to rebuild a new model and ensuring there is a legacy of knowledge dissemination and skills development to support industry. The ultimate aim is to build a more sustainable and adaptable skills and knowledge development model. One that is a collaborative effort and does not become irreparably damaged after suffering 'a fall' or setback because of changing policies or economies with respect to supporting the core capacity of Australian primary industries. The insights gained during this Fellowship have provided vision and impetus to undertake this challenge.

9. References

- AECL (2012) Australian Egg Industry Annual Report 2011/2012.<http://www.aecl.org/system/attachments/583/original/Annual%20Report%202012.pdf?1353999180> accessed March 2013
- Baker, A. (2012) Pers. Comms. Mr Adolphus B. Baker, Chief Executive Officer and President of Cal-Maine Foods, Inc. Chairman of American Egg Board, United Egg Producers
- Blandy, R., Dockery, M., Hawke, A & Webster, E., (2000) Does Training Pay? Evidence from Australian Enterprises, National Centre for Vocational Education Research (NCVER), Leabrook ISBN 0 87397 664 9
- Clarke, M. (2010) Poultry Industries Research, Development and Extension Strategy: A national assessment of capabilities to ensure innovation that improves productivity and delivers public good outcomes strategies http://www.npirdef.org/cms_strategy/project/10, accessed March 2013
- Cornerstone Report (2012) President's Budget Request for FY 2013, Vol. 10, No. 1 Released February 13, Washington <http://www.land-grant.org/reports/2012/02-13.htm> accessed 26/12/12
- Cornell University (2012) Website <http://www.cornell.edu/landgrant>, Accessed 24/12/12
- Czarick, M. (2012) Pers. Comms. Dr Michael Czarick, III, Extension Engineer, College of Agricultural Environmental Sciences, Department of Poultry Science, University of Georgia
- DEFRA (2013) Department of Environment, Food and Rural Affairs, The Rural Development Programme for England, website <http://rdpenetwork.defra.gov.uk/news-and-publications/defra-news/national-rdpe-skills-framework> accessed February 2013
- DIICSRT (2013) Australian Government Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, National Work Force Development Fund Website, <http://www.innovation.gov.au/Skills/SkillsTrainingAndWorkforceDevelopment/NationalWorkforceDevelopmentFund/Pages/default.aspx>, accessed February 2013
- Doucouliagos, C and Sgro, P.(2000) Enterprise Return on a Training Investment, National Centre for Vocational Education Research (NCVER), Leabrook ISBN 0 87397 632 0
- Ehr, I. (2012) Pers.Comms. Dr Isa Ehr D.V.M, Technical Sales Veterinarian, Hy-Line International, Dallas Centre, Iowa, USA
- Farmers Guardian (2011) New AD design offers cheaper, low-maintenance alternative, September 30, <http://www.farmersguardian.com/home/livestock/livestock-news/new-ad-design-offers-cheaper-low-maintenance-alternative/41747.article>
- Gregory, C. (2012) Pers. Comms.Mr Chad Gregory, President and CEO United Egg Producers, Georgia, USA
- Grundy, S. (2012) Mr Sam Grundy, Farm Demonstrator and Coordinator, Reaseheath College, Cheshire, UK
- Iowa State University (2012), Department of Animal Science Web Site http://www.ans.iastate.edu/EIC/About_US.dwt accessed December 2012
- Kreager, K. (2012) Pers. Comms. D.V.M, A.C.P.V. Senior Technical Service Veterinarian, Hy-Line International, Dallas Centre, Iowa, USA
- Livestock Northwest (2013) Northwest Livestock Programme, Rural Development Programme for England Website <http://livestocknw.co.uk/> accessed February 2013
- May D., (2011) Pers. Comms.Mr David May, Chief Executive Officer, D.A. Hall and Co. Pty Ltd. Millmerran, Queensland, Australia
- NZQA (2013) New Zealand Qualification Authority Website <http://www.nzqa.govt.nz/qualifications-standards/qualifications/> accessed February 2013
- Patterson, P., (2012) Pers. Comms., Professor Paul Patterson Pennsylvania State University, Pennsylvania, USA

9. References

- Pelissero, H., (2012) Pers. Comms. Mr Harry Pelissero, General Manager, Egg Farmers Ontario, Mississauga, Ontario, Canada
- PISC (2001) Primary Industries Standing Committee: Model Code of Practice for the Welfare of Animals – Domestic Poultry, 4th edition; CSIRO Publishing
- Runge, G.(2012) Pers. Comms. MrGeofRunge. Former Queensland DPI Extension Officer, consultant to AECL. Queensland, Australia
- Scott, G., (2012) Pers. Comms. Dr Graham Scott, Senior Lecturer, Harper Adams University College, Shropshire, UK
- Smith, A. (2001) Return on Investment in Training, National Centre for Vocational Education Research (NCVER), ISBN 0 87397 779 3, Australian National Training Authority, Leabrook, Australia
- Stewart, G (2012) Pers. Comms, Dr Geoff Stewart. Principle Consultant, Queensland Agricultural Consultants, Hen Welfare Expert, Chief Poultry Trainer and Assessor - CHM Alliance, Laidly, Queensland, Australia
- Tocal College (2013) Web Site, <http://www.tocal.nsw.edu.au/home>. Accessed March 2013
- Telford, M E., P. H. Hoiroyd, and R. G. Wells (1986) The History of the National Institute of Poultry Husbandry, Harper Adams Agricultural College, Shropshire, UK
- UEP (2012) United Egg Producers Website <http://www.unitedegg.org/GeneralStats/> accessed December 2012
- USPEA (2010a) Your Future is now: Careers in the Poultry and Egg Industries DVD, U.S Poultry and Egg Association, Tucker, Georgia, USA
- USPEA (2010b) "Poultry and Egg Production Curriculum: A resource for High School Agricultural Educators" DVD, U.S Poultry and Egg Association, Tucker, Georgia, USA
- USPEA (2008) Single Vehicle Rollovers Driver Awareness Program DVD, U.S Poultry and Egg Association, Tucker, Georgia, USA
- U.S. Code (2004a) Title 7: Agriculture, Section 301 Land grant aid of colleges <http://us-code.vlex.com/vid/sec-land-grant-aid-colleges-19268404>
- U.S. Code (2004b) Title 7: Agriculture, Section 321 Secretary of Agriculture to administer annual college-aid appropriation <http://us-code.vlex.com/vid/administer-college-aid-appropriation-19268389>
- U.S. Code (2004c) Title 7: Agriculture, Section 343 - Appropriations; distribution; allotment and apportionment; Secretary of Agriculture; matching funds; cooperative extension activities
- <http://us-code.vlex.com/vid/allotment-apportionment-matching-extension-19268366>
- Voiceless (2013) Website <http://www.voiceless.org.au/content/what%E2%80%99s-happening-animal-law> accessed April 2013
- Widowski, T. (2012) Pers. Comms. Professor Tina Widowski, Animal & Poultry Science, University of Guelph
- Wikipedia (2013) Humpty-Dumpty, from Wikipedia, the free encyclopaedia http://en.wikipedia.org/wiki/Humpty_Dumpty accessed April 2013

10. Appendices

Appendix 1: Questions used to guide discussion during the International Experience

Aim: Focusing on egg specific context, what training resources are available (delivery mechanism) for leading egg industries to identify and learn from experiences, build networks for the future and feedback information to our training strategy?

1. Could you tell me a little about training in the egg industry from your perspective?
2. What courses are available?
3. How are they accessed? Who attends?
4. How is training structured/who is responsible?
5. What incentives are there for participation?
6. What are the drivers for training?
7. Can you give me specific examples (courses/topics) and the delivery model?
 - a. Is it effective?
 - b. How could it be improved?
 - c. Who pays and how much per student?
8. Is it hard to find farm workers?
9. How do new employees get trained?
10. Is there a well-defined career path in the supply chain?
11. What is the rough education level in the supply chain?
 - a. Shed workers
 - b. Shed managers
 - c. Site managers
 - d. Grading
12. How do improvements/changes in practice reach production? How long does it take?
13. Are there barriers (language/literacy) how are these addressed?
14. Informal/formal training?
15. Key skills vaccination? Beak trimming? Handling? Welfare? QA? Technology/system changes?
 - a. Who does it?
 - b. Where are skills accessed?
 - c. Any examples? Are they available? How are they kept current?
16. Is subsidy provided?
17. Risks with training, what hasn't worked in the past? What happened?
18. Have you undertaken skills training? (Question for farm employees)
19. Is it promoted on-farm?
20. What was effective?
21. What skills/knowledge?
22. What do you plan to be doing in five years?
23. Other comments/notes.