

Alternatives to Cage Egg Production

Are they all they're cracked up to be?

A report for



By Robert Pepper

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Executive Summary

The Australian egg industry is quietly in a crisis. Prices have fluctuated between solid and marginal over the past five years as diseases have impacted on the industry both domestically and internationally in countries as disparate as the United States (USA), Germany, Iran and South Korea. Uncertainty about the direction of welfare legislation and free range stocking densities meant that some investments were put on hold in Australia. That question was resolved by State and Federal governments in the Australian Consumer Law (Free Range Egg Labelling) Information Standard 2017 and ever since then significant investments into alternative egg production have been made, and continue to be made at the behest of certain powerful customers.

Almost overnight, domestic supply exceeded domestic demand and the export opportunities of the past few years have not been available due to events in the USA, which have led to overproduction. The compounding effect of a small percentage of surplus eggs each day has meant that eggs have been travelling around the country in a giant game of hot potato and no one wants to be left with the stock when the best before date is up.

Against this backdrop of short-term angst, questions about the long-term viability of each of Australia's three official production systems (cage, barn and free range) remain.

Australia's egg farmers can learn from the experiences of other farmers around the world and avoid the excesses of other markets around the world if they are united in their defence of using the best available technology and knowledge to ensure hen health is maximised, including modern Model Code-compliant cages. The egg industry may need to embrace a more open and transparent mandatory traceability program to make it harder to mislabel eggs from one production system as coming from another.

This report makes observations and recommendations about common challenges and management issues with alternative production systems. It recommends egg farmers show voluntary restraint in expanding alternative egg production; to only do so in response to consumer demand and when the long-term viability of a particular site has been considered, to, invest in rearing that mirrors a hens' future production systems and contribute to industry training programs for the benefit of their organisations and the reputation of the industry as a whole.

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Foreword

The commercial egg industry in Australia is a relatively small community. The biggest producers and buyers of eggs are reasonably well known to each other, either personally or by reputation. Compared to the consolidation that followed egg industry deregulation in the eastern states in the 1990s, for the most part, there are cordial relations between egg farmers.

A complicated web of contracts and distribution arrangements has also evolved to ensure that eggs flow freely around the country. Naturally, the relationships between major retailers as buyers of eggs and the egg industry are not always simple either, and at times have been collaborative but at other times tend to be more competitive or even adversarial.

There are numerous technical issues facing the industry as it turns increasingly to alternatives to cage egg production and these are being addressed by both scientists and farmers daily. The cumulative effects of the problems in chicken health and behaviour that are encountered when farmers place their hens in less controlled environments than cages result in fewer eggs per hen housed and fewer eggs per kilogram of feed supplied. These inefficiencies affect costs involved in non-cage egg production. This report, however, is intended to address the biggest issue facing the industry – viability in the medium to long term. The topic was initially framed as ‘best practice in alternative egg production’ due to a desire to see how other egg farmers around the world are dealing with the challenges presented by taking hens out of cages and allowing them more freedom to engage in natural behaviours, both positive and negative. It was never likely that there would be a single ‘silver bullet’ to achieve cage-like levels of productivity and low mortality but it was hoped to find several things common to the best operations that could be shared in Australia.

It became apparent that each farmer operates differently depending on scale, location and nature of their operations. Many also differ materially from Australian farming conditions so this forced a re-evaluation of the questions worth asking. Over eight weeks, it was simply not possible to perform a detailed statistical survey of the world egg industry and conclude that the best way to manage hens in alternative systems is ‘xyz...’. With egg farming there is no one-size-fits-all option, although a number of issues are considered in Chapter 4.

Unfortunately, much of the information disclosed by egg farmers as part of the research was provided on the understanding that sensitive commercial details or the storyteller themselves would not be revealed, even inadvertently.

Questions that had been discussed casually at early visits took on added significance over time, such as:

- What happened historically in the developed consumer markets of Europe and USA to bring them to where they are today?

- How had they broadly adapted and responded to these changes?
- How were they continuing to do so?
- What further changes did they expect?
- What are the implications of all of this for Australian egg farmers?

It became obvious is that any consideration of the future of alternative production systems in Australia could not ignore the future of cage egg production because its continuation will have a bearing on the pace and scale of expansion in alternative egg categories.

Some Australian egg farming operations are large family businesses and they are doing many things well – well-informed, well-travelled and well-resourced, but improvement is always possible and even industry leaders are not immune from making strategic miscalculations with consequences which are magnified by their scale. Due to the threat posed by negative public perceptions about egg farming, there is both a moral and economic imperative for the industry to focus on continuous improvement.

Countries visited included the United Kingdom (UK), the Netherlands, Germany, Canada and the USA. Previously in 2013, the author had also visited the UK, the Netherlands, Belgium and Germany on a visit specifically relating to cage free egg production. Observations from that trip, whilst not specifically discussed in this paper, were certainly of assistance in providing background to the nature of those markets.

Brief family history

I joined the family business in 2009 but Ivo Peffer started with six hens in 1955 and throughout my life the farm has always been an important part of our family. Despite my father's move off farm and into a career in accounting, he maintained involvement with the business, particularly on the financial management and governance side. Accordingly, I have always had great pride in what our family has accomplished. Now that I have joined the business and seen the best and the worst of what egg farming looks like *Peffer-style*, I have gained a greater appreciation for the challenges but also a sense of optimism about the future of this versatile and incredibly nutritious product: the egg.

Ivo followed the transition away from barn and free-range production into cages to improve management and health of the birds, reducing the spread and impact of various poultry diseases. Shortly before his death he commented (or perhaps, lamented) that the industry was coming full circle within his lifetime. With more hens being kept in alternative systems, he believed that the reasons for moving to cages in the first place would eventually become apparent to a new generation, but at great cost to both farmers and hens.

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It has been a very great privilege to undertake a Nuffield Scholarship.

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I am very grateful to Australian Eggs for their support of Nuffield. I have enjoyed working with them and I am keen to continue to repay the investment that has been made in me.

Thanks also to my late grandfather (and founder of our family business), Ivo Peffer, for his permission and support that enabled me to be absent at all. Sadly, he passed away in April 2016, but his approval was a prerequisite to putting the necessary arrangements in place. Particular thanks to my uncle, Colin Peffer and cousin, Josh Peffer, as well as other staff for taking on extra farm responsibilities in my absence.

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Abbreviations

ACCC: Australian Competition and Consumer Commission

CSIRO: Commonwealth Scientific and Industrial Research Organisation

EU: European Union

UK: United Kingdom

USA: United States of America

UEP: United Egg Producers

Objectives

This report is intended to address the biggest issue facing the industry – viability in the medium to long-term. Objectives included:

- Review how other egg farmers around the world are dealing with the challenges presented by taking hens out of cages.
- What are the positive and negatives of allowing hens more freedom to engage in natural behaviours?
- What happened historically in the developed consumer markets of Europe and USA to bring them to where they are today?
- Identify positive production practices that are common to the best egg operations in the world.

Chapter 1: Introduction

Australia's place in the world

Australian egg farmers have been facing a period of significant uncertainty. Around the world there are different trends between developing countries, which are increasing cage capacity and developed nations who are responding to consumer perceptions about hen welfare and seeking alternative systems. The dominant alternative in Australia presently is free range, but elsewhere barn or cage-free production is dominant, and free range is a niche market associated with organic diets. There is a correlation between the dominant production system, the availability of land for ranging chickens and the weather extremes experienced.

Australia has been a follower of world trends with egg production, partly because the equipment utilised in Australia is manufactured in Europe. Leading Australian egg farmers are amongst the most technologically advanced in the world and this appetite for high-tech shed control systems is driven by the high minimum cost of labour in Australia and weather extremes, requiring significant monitoring and automation in climate control systems for hen houses.

Although most developments are driven by European innovations, Australians are often early adopters of technology as hen houses are typically intended to have a long life. Newer digital and sensory technology today will nonetheless be old technology before it is fully depreciated. The latest generation of fans are significantly more energy-efficient and the ability to marry them with variable speed motors rather than staging multiple fans to switch on and off more frequently enables better temperature control and smoother power usage.

The rest of the world, however, is not all going in the same direction at the same pace. Different regions are moving in diverging directions: in some (mostly developing) countries, farmers are taking hens off the ground and putting them into cages as quickly as possible while more developed nations are doing the opposite. At the latter end of the spectrum, some countries have even implemented partial, total or de facto bans on some or all forms of cages. Switzerland was the first nation to ban cages back in 1992 (O'Keefe, 2011) and several other nations have enacted partial or effective bans since then, most notably in the European Union (EU).

This trend towards limiting or removing the use of cages can be seen in Australia too. Discussions with manufacturers suggest that there have been virtually no new cages built for several years, and the last major period of cage installation was simply replacing out-dated cages in the early to mid-2000s. Whilst it is not illegal to produce or sell cage eggs in any state or territory in Australia, the Australian Capital Territory no longer has any cage egg production (Barr, 2012) and it is doubtful whether many local governments would grant the necessary approvals if one were proposed.

The Model Codes of Practice for the Welfare of Animals: Domestic Poultry (CSIRO) is currently under review with new Australian Animal Welfare Standards and Guidelines for Poultry due to be released soon.

This is a significant opportunity for supporters and opponents of cage egg production to state their cases. The outcome of this review is far from certain. The release of the current Model Code has led to the last round of major investment in cages once it was clear that there was no proposal to phase out cages but increased space per bird was required.

Even if this review of the Model Code permits cage egg production to continue largely unchanged, retailers may yet decide not to sell cage eggs for their own reasons. This has occurred in the USA. Fortune magazine published an article called *Inside McDonald's Bold Decision to Go Cage-Free* highlighting a McDonalds announcement of a 10-year plan to produce cage free eggs.

Thus, question hang over the future of cage egg production in Australia, yet the majority of Australian eggs are still produced by hens in cages. How can the buying behaviour of consumers be reconciled with the theoretically overwhelming unpopularity of cages? How should the industry choose to invest today when it needs to last at least 15 years? What will the egg industry in Australia look like in 2030?

When asking these questions to Australian egg farmers, the main responses have been:

1. **Trust the market:** Cages will be around while consumers are happy to continue to buy these eggs;
2. **They can prise cages from my dead hands:** Cages are not popular with a loud minority, but the industry needs to lobby government to delay banning them or ensure there is adequate compensation. All existing cage investments must be allowed to run their course; and
3. **Abandon ship:** Cages are doomed, the battle is lost, and every effort should be made to convert to alternatives as soon as possible.

Each of these positions can form a reasoned case but each faces difficulties. Predicting the future is an uncertain business at the best of times.

1. Trust the market

Attempts in Australia to phase out or ban cage eggs have been largely unsuccessful to date. Australia's three major retailers have made public statements about plans to cease selling cage eggs, which receives media attention. In 2017 when news stories gave the impression that cage egg sales were in freefall due to a small decline in market share, sales of cage eggs increased.

Some smaller retailers like Harris Farm have been implementing cage egg bans at their own expense – that is, by buying non-cage eggs at sustainable prices.

Coles supermarket

Coles announced with much fanfare in 2012 that it would no longer sell cage eggs, and this was followed by Woolworths (Whyte, 2013). Both are however, still selling cage eggs at the same entry level price point and in virtually the same packaging. They have limited the shelf space available to cage eggs, but those sections are often empty because sales outpace stock replenishment rates. It is possible for consumers to interpret this as being due to a decline in the production of cage eggs instead of a profit-maximisation strategy of retailers to ensure that the highest value and highest margin stock is always available.

Coles have promoted free range eggs at low price points, which has a significant impact on the industry. They are pursuing a strategy that is focused on driving the free-range price down until it is comparable with cage eggs.

Despite suppliers knowing the margins that are added by retailers, and how the differences in margins are responsible for encouraging consumer choices, retailers regularly make public comments explaining that they are finding it difficult to sell cage eggs but the free-range eggs are selling well.

Woolworths supermarket

Woolworths announced late in 2013 that they would cease selling cage eggs under any brand name in 2018 (Whyte, 2013). This created pressure on suppliers to ensure they would be able to meet forecast sales volumes in non-cage eggs.

Woolworths conducted a trial of removing cage eggs in the Australian Capital Territory. Soon after cage eggs were returned to shelves as a certain demographic of Woolworths' consumers prefers cage eggs.

In November 2016, Woolworths representatives addressed an Egg Industry Forum in Torquay, Victoria, and conceded they would not be following through on their public commitment to remove cage eggs in 2018 (Mitchelson, 2017). However, significant investments had already occurred by many farmers on the assurance that they would be in a good position post-2018.

Aldi supermarket

Aldi announced that it would no longer stock cage eggs after 2025, affirming a decision that was already made by Aldi globally (Aldi, 2018). Australian media heralded it as a victory for a social media campaign by various animal activist groups and particularly a 14-year-old girl in Melbourne (Figure 1) with an online petition (Tippet, 2016).



Figure 1: Angelina Popovski has had success in her campaign to get Aldi to stop selling caged eggs. Picture: Richard Serong (2016)

Foodservice and wholesale

Others have made announcements to convert from cage to cage-free with varying deadlines such as McDonalds, Subway, Hungry Jacks, Mars and the Coffee Club. In some cases, the public announcement is being made without consultation with their egg suppliers.

2. They can prise my cages from my cold dead hands

The primary response of those who do not want to see cages banned is to lobby government to protect farmers. This can be effective in the short term, but politicians are not selected for their courage to make unpopular decisions but willingness to implement popular will.

Cages are still the dominant production system in Australia, and it is still possible to mount a strong case that they should remain part of the production mix. The feed conversion and consistently low mortality rates as well as minimal disease outbreaks and lower carbon footprint of cage systems make them a efficient form of egg production. Caged hens also require no antibiotics and are an affordable source of protein to consumers on a tight budget.

3. Abandon ship

Many large commercial egg farmers in Australia have a range of production systems, including caged hens. However, there are a growing number of egg farmers who only farm small numbers of low-density free-range hens. Many have become advocates for the benefits of free range. Some larger free range producers have concerns that smaller operators are not subject to the same biosecurity and zoning rules.

Animal rights activists

Animal rights activists play a role with consumer behaviour. For example, Animals Australia have a webpage that outlines the five things the egg industry doesn't tell you (Animals

Australia website). These activists are tireless in their lobbying techniques, targeting Members of Parliament, supermarkets and individual company Chief Executive Officers.

When reputations take time to build, companies are sensitive to brand damage and lobbying techniques of threats increase the likelihood of management teams rushing to make an announcement on the subject without all the scientific evidence and facts on both sides.

Australian Eggs Sustainability Framework

The Sustainability Framework seeks to give meaning to the Australian egg industry's objective of farming eggs for Australians in a manner that is socially, environmentally and economically responsible (Australian Eggs, 2018).

It was initially released as a survey to a representative sample of Australians, carefully weighted to represent the general population in factors such as age, gender, geography and social-economic status. The link to the survey was then made public, the RSPCA became aware of it and encouraged supporters to make their views known in order to influence the results. The results showed that the average RSPCA responder was female, older than 30, affluent and working in the public sector (education and healthcare) (CSIRO, 2018).

These lobbying efforts have proved very successful in the USA which until recently had over 90% of its egg laying hens in cages, both conventional and enriched with more space, perching and nests. Since February 2016, there have been announcements of intentions to go cage free equating to over 70% of their entire flock by 2025 (Windhors, 2018). This will require billions of dollars of investment and comes despite cages remaining legal in most states after a negotiation with animal rights advocates to introduce colony cages which are roughly equivalent in size to between three to six conventional cages (Fatka, 2011).

Many major producers had already begun to invest in the new colony cages when the retail sector made announcements, which effectively shifted the goalposts. Initially a handful of businesses made announcements, including McDonalds, and that was followed by more without supplier consultation (Anon, May 2016).

The heart of the activism business model is success in forcing change and selling the feeling of that success to their supporters.

ACCC enforcing the law selectively

Overall egg consumption has continued to rise in Australia due to both increasing consumption per capita and population growth (Australian Eggs, 2018). Without additional cage construction, the growth in egg supply has come from additional barn and free-range facilities but cage eggs are still popular and sales are not diminishing in absolute terms.

Whilst the Australian Competition and Consumer Commission (ACCC) has pursued egg farmers for selling free range from facilities that it regards as failing to meet its definition of consumer expectations, there is a belief within the industry that they will not enforce the

law against farmers who are passing off free range eggs as cage free or caged or passing off cage free eggs as caged. This is clear from several prosecutions of small and large free-range farmers for substituting cage or barn eggs for free range eggs or failing to meet the ACCC expectations of what is or is not free range. Despite the widespread practice of 'downgrading', there have been no attempts to police this practice, but it remains an issue for the industry. Furthermore, it sends distorted pricing signals to farmers who are considering expanding their free range or barn facilities.

If the ACCC continues to turn a blind eye to this practice it is content to allow consumers to be significantly misled about where and how their eggs are produced, and to pay higher prices for free range. From a policy perspective, there are many reasons for the ACCC to enforce the law impartially. If the unelected bureaucracy is making these discretionary enforcement decisions on some other basis, it is concerning that the decision to not enforce a particular law evenly is being made with no recourse for the disadvantaged parties.

One possible solution to this issue is to allow more flexible descriptions of the eggs sold in retail packs. Instead of being required to nominate only one of the three production categories currently defined, cartons could disclose that the eggs within them may have come from more than one production system. There could also be redefinition of the current egg categories added to disclose to consumers the relative intensity or other characteristics of the production system their eggs come from such as whether the hen house contains a percentage of litter area or perches and other furnishings.

Commercial scale hen houses and poultry farms must have access to abundant power and water and not be in close proximity to existing residential areas. In addition, development applications for poultry farms – and other forms of intensive animal agriculture – often attract substantial numbers of objections, slowing projects down or preventing them altogether. So egg farmers in Australia face a situation where the easiest and most cost effective system per bird (cages) are not a safe investment but other forms of egg production are not necessarily easy to establish either.

Cage eggs can still have a place in a production system. As mentioned in this chapter, they are efficient, bio-secure and environmentally sustainable form of hen housing.

Chapter 2: Losing the Public Debate

Public perception of egg farming

Egg farmers in advanced economies are sometimes perceived as exploiting their hens for commercial gain. This view is promoted by animal rights groups who have formed a number of professional organisations. Their campaigns have emotive language and are often light on meaningful measurements of welfare like mortality.

In developing countries these groups gain less traction as there is less disposable income to spend on food. Once the most basic of human needs are met, people have the luxury of considering how their food is produced.

How can they know if no one tells them?

Specialisation of work and the trend towards urbanisation, which has continued since the industrial revolution, means that most people have little direct contact with food production.

Farmers are a small minority of the population and the egg industry is a good example of this. There are approximately 17 million egg laying hens in Australia (Australian Eggs, 2018) most of which are owned by a handful of large commercial producers.

[Egg Farmers of Australia](#) is the peak advocacy body for egg farmers in Australia and welcomed the opportunity to provide a submission in response to the consultation on the next Animal Welfare Standards and Guidelines process.

Alternatives to cage egg production systems are still a minority of the overall egg production in Australia but they have made their most significant gains in the retail sector, despite cage eggs being generally cheaper. This trend suggests an increasing number of (although not all) consumers are sufficiently motivated to buy on some factor other than price.

Animal activists have also targeted large-scale commercial producers of free-range eggs. This suggests that it is not only cage egg production they oppose, but the use of animal products for human consumption. Ironically, eggs are a non-terminal protein – the hen does not die to produce the egg. So, eggs should be a good news story for people who want a balanced diet without animals being killed for their plate.

Case Study: Burnbrae Farms

Farmers need to tell a good story and this is being done successfully in Canada. One example is Burnbrae Farms. They are exceptionally positive and active on social media about their farming practices and defend their supply management scheme, which is a form of quotas that regulate bird numbers to prevent oversupply.

Burnbrae Farms are doing an outstanding job of market leadership in this area. They are a fifth-generation Canadian family-owned and operated company that continues to be one of Canada's leading egg farmers, with farms, grading stations and processing operations across the country.

Sovereign risk in Australia

There is an increase in the perceived sovereign risk posed to businesses by all levels of government and, in particular, businesses that rely on animals and animal by-products. The two most prominent examples (both of which were later reversed) were the sudden halt of the live export industry by the Federal Government in 2010 and the 2016 decision of the New South Wales Government to close the greyhound racing industry.

Both decisions came as a shock to the industries involved and were in part a consequence of lobbying efforts by animal activists and government decision makers' assessment of the public's lack of support for various production practices within the industries.

In preparation for the review of welfare standards, the RSPCA released its own study purporting to show that cage hens suffer various health problems, yet the health implications of caging hens have been studied extensively over many years.

Individual egg farmers may or may not choose to respond to every claim made, but if there are no positive news stories about egg farmers and egg farming, the field is left vacant for those who oppose egg production.

Chapter 3: Auditing Everything

Food safety or industry integrity?

In recent years, the audit industry has thrived on quality management systems, food safety regulations and the concept of continuous improvement. Standards are constantly being revised and updated.

Every large commercial egg farmer liaises with multiple customers and stakeholders with their own audit criteria including state food authorities, Woolworths Quality Assurance, Coles Supplier Requirements, McDonalds Supplier Program and Aldi Supplier Requirements.

Audit criteria are being used to outsource risk from egg retailers and the foodservice industry back onto farmers. Some customers require access to wages and other employee records. These types of audits are less about practical food safety outcomes and more about being seen to do everything theoretically possible to avoid brand damage.

The cost of complying with these requirements is not compensated for directly in the price customers are willing to pay. The primary incentive for compliance is market access to those customers and the substantial volumes of eggs they will buy on a consistent basis. The local corner store is not able to insist on these types of regimes because farmers would simply decline to supply them. Major retailers and the foodservice industry can offer sufficient stable volumes at prices that make the compliance costs seem bearable.

Case Study: United Egg Producers, USA

The egg industry globally has responded to this challenge in different ways. Producers in the USA are faced with a highly fractured retail and foodservice sector and large farmers are in a similar situation to that of Australia where they have multiple audits to multiple varying standards. Examples include McDonald's requiring suppliers to follow new standards for raising and slaughtering chickens served in its restaurants (Polansek, 2017) and Walmart being committed to continuous improvement and aspiring to achieve the "Five Freedoms" of animal welfare for farm animals in their supply chain (Walmart, 2018).

Some US farmers are not thrilled about this (Pers. Comm, anon farmer, Washington DC, May 2016) but are resigned to it and due to the size of their market they each chart their own course in determining what standards they wish to be certified with and which customers they are able to supply. United Egg Producers (UEP) developed guidelines for optimal hen well-being – guidelines that are backed by research and recommendations from an independent Scientific Advisory Committee. UEP Certified established guidelines for conventional cage housing in 2002 and for cage-free in 2006 (UEP, 2018).

The UEP mandates the washing of eggs, which is not required in most of Australia. Washing eggs affects the quality and reduces the shelf life of the eggs. US farmers also have to manage the possibility of *salmonella enteritidis* which can be present inside the egg.

Case Study: Lion Code, UK

In the UK, egg farmers had a shock in December 1988 when junior government health minister Edwina Currie stated on television that the majority of eggs in the UK likely contained salmonella (Mann, 2018). Egg sales fell so dramatically overnight that birds had to be culled to reduce stockpiles. In order to rebuild the credibility of the entire industry, the vast majority of UK egg farmers adopted the Code of Practice for Lion Eggs (Lion Code).

The British Lion scheme is the only UK egg-specific assurance scheme that meets the standards of the ISO 17065 international accreditation standard. More than £100 million from the UK egg industry has been invested into the British Lion scheme since its launch, more than two million eggs have been tested and 50,000 audits have been carried out (Egg Info, 2018).

Farmers appear to be in favour of the Lion Code and believe that it offers a way of distinguishing the quality control of UK eggs compared to cheaper European imports.

The author attended a Lion audit at a free-range farm near Milton Keynes which supplies UK egg farmer and Nuffield Scholar Doug Wanstall (2015). The process required a thorough check of the paper trail of the hens including their entire life history to that point. The records went right back to the hatchery and parent stock and continued through rearing and placement on their farm, ensuring the correct vaccinations had been administered and any other treatments required during adulthood were fully documented. There were also strict requirements around swab testing for salmonella. This comprehensive program is accepted as a necessary requirement for regaining the trust of British consumers.



Figure 2: English Nuffield Scholar Doug Wanstall (2015) on one of his free-range farms near Milton Keynes (source: author)

If there is one drawback to a rigorously implemented quality assurance being adopted, it is that the eggs can be largely interchangeable across the country. The UK retailers have taken advantage of this to pit farmers against one another in competing for tendered contracts.

The premium for being a supplier with access into a limited market has thus been diminished. This is not the sole reason. The UK also has a highly concentrated grading sector and UK retailers have vigorously pursued a private label strategy to the point where each chain almost exclusively sells their own branded eggs. Operating their own brand enables retailers to switch egg suppliers very easily and does not encourage consumers to build any brand loyalty to the egg graders or to individual egg farmers.

Hence this system appears to be designed to achieve a strong minimum food safety and hen welfare standard and thereby restore public confidence in UK eggs but it provides little incentive to be exceptional in quality. One form of product differentiation is the return of traditional breeds to the supermarket shelf. There is also a reaction against the dominance of generic supermarket brands through the trend towards farmers' markets and consumers taking an interest in the geographical origins and provenance of their food. These segments are still a small minority of the overall market and have often been captured in part by the organic movement, believing that product integrity goes hand in hand with small scale organic farming systems.

Chapter 4: Flock Management in Alternative Systems

Management: what is the difference?

Fundamentally, keeping hens in alternative production systems requires more bird behavioural management to achieve the same or reduced egg production results compared to cage systems. When hens are free to do whatever they want, they do not necessarily do the things that result in better laying performance. For example, free range hens will eat things that the farmer would prefer they did not eat – like the manure of other hens. They drink from any muddy puddle in their range area. A single bird in a cage system only has access to a few other hens to bully but in an alternative system they can have a far greater influence by teaching many other birds to pick at feathers too. This can eventually lead to cannibalism and is extremely difficult to stop once it starts.

For some of these issues, there is nothing at all that can be done. Chickens will eat just about anything. If there are alternative foods available, they will try them no matter how good the feed provided by the farmer. When it comes to issues like feather pecking or picking, there are some things that farmers can try like changing the timing of feeds, composition of feed mixes or reducing the intensity or colour of the house lighting but there are no silver bullets that completely resolve these issues once they have started because the hens will not un-learn the behaviour.

Farmers have a limited range of levers they can pull when it comes to modifying flock behaviour once the hens have been placed. The key variables that farmers can influence in most modern hen houses are feed, lighting and climate. In each case, farmers have more control over these variables in barn houses. Once the doors are open in a free-range system the hens can eat anything they find and the internal shed environment is heavily influenced by the outside conditions.

However, before the hens arrive as pullets for placement into their production system, many farmers believe their performance potential has already been set based on how well they have been raised or reared during the first 15-17 weeks of their lives.

Rearing: everyone is talking about it

A recurring theme in discussions with farmers around the world was that hens must be reared with their placement destination in mind. Ideally, the system used to rear the hens should be as similar as possible to the system they will be moved into for the duration of their laying life.

A typical scenario where farmers can experience problems is where floor reared hens are placed into aviary production systems. Those who had experienced this spoke of horror rates of floor eggs exceeding 15%. To put these numbers into perspective, in a flock of

20,000 hens, this could easily equate to picking up over 600,000 eggs during the life of the flock and forgoing substantial sales revenue because floor eggs are not permitted to be sold for consumption as whole or retail eggs. In some cases they may be used for processing into egg products. Taking the labour cost of collecting and disposing of eggs into account, this can make the entire flock unprofitable or, at best, marginal.

Each major commercial layer strain or breed has a standard performance level. This is usually provided to farmers in the form of a booklet or similar document and it includes information about the expected performance of hens in that breed across a number of indicators. During the rearing stage, the breed standard tells the pullet rearer what weights they should expect the birds to attain week by week. During production, standards tell farmers what bird weights, egg weights and egg numbers they should expect if they are on track for a 'typical' performance from a flock of that breed. It is an important management tool and many producers track the performance of their flocks against the breed standard.

One critical measurement is peak lay, which is the point at which the highest number of birds in a flock is laying one egg every single day. This is a significant number because a higher peak makes a higher average performance possible over the life of the flock. For example, according to the Lohmann Brown-Classic Management Guide, a peak of 93-95% should be expected from a Lohmann Brown-Classic flock (Lohmann Brown). However, a peak of 96% or 97% is entirely possible in a cage system – a 100% day is not theoretically impossible, but it is to be expected that not every hen in a large flock will lay every single day.

In the course of this study, it was apparent that farmers were unanimous in expressing their belief that non-cage flocks struggle to achieve high peaks. Thereafter most likely struggle to achieve the breed standard level of production over the life of the flock if they experienced a disruption during rearing (such as a disease or feed problem) or were not reared in a system that prepared them for their destination. As a consequence, businesses like The Lakes Free Range in the UK and Herbrucks in the US rear their own pullets or, if necessary, work very closely with other pullet rearers to ensure that they are controlling the quality of their flocks from the earliest possible time.

It was not easy to find new rearing facilities to visit as some farmers do raise their own pullets primarily as part of their quality control and not as a profit centre. Biosecurity on rearing farms is generally tighter. However, The Lakes Free Range has recently built a new rearing facility, which manager Roger Giles believes is working successfully. The new house has underfloor heating in strips with corresponding darkened canopies on winches. The air temperatures in the rest of the room is held at a comfortable 20-25 degrees Celsius early in the rearing stage which saves considerably on energy costs compared to holding part or all of the house at 33-36 degrees Celsius. The theory behind the design is that the canopies correspond to the heat provided by a mother hen and the chicks can come out from under the canopies at will to access the feed and water. At the same time the lower house

temperature makes it easier for employees to spend much more time in the house. Roger believes that the better working conditions should correspond to better workplace health and safety for employees and fewer shortcuts by employees who just want to get out of the typical sauna-like conditions.



Figure 3: Experimental rearing facilities for The Lakes Free Range (source: author)

Lights: a kaleidoscope of options

Chickens naturally respond to daylight. Hundreds of thousands of so-called backyard hens across the country lay fewer eggs in autumn and winter as the daylight hours are reduced. Later in winter and into springtime, as daylight hours begin to lengthen, these hens begin to lay again and contribute to the historical spring egg oversupply in Australia. The same phenomenon affects free range egg farmers who allow their birds to operate under completely natural conditions. In Australia, this is typically thought to include those farmers who market their eggs as *pastured* and move them around range areas in small mobile sheds or caravans. The outcome can be observed in rising egg inventory levels nationally over the spring and into summer, aside from the weeks before Christmas. The situation is referred to as *the Spring Flush*.

Light is also used during the rearing process. Standard lighting programs use long periods of daylight in the first few days of the chicks' lives so that they have every opportunity to find food and water and get off to a good start in life. Over time the hours of light are often

reduced to allow the chicks plenty of time to rest more and not burn energy unnecessarily. As the time approaches for their placement into their laying house, the hours of light begin to be increased to stimulate the hens to lay. One grower who the author met as part of the study also suggested that if a batch of chickens struggles to meet its benchmark targeted weights for any reason then he would include a midnight feed, switching the lights on briefly and immediately running an additional feed to stimulate the birds to eat.

Standard lighting programs such as that of the Lohmann Brown-Classic provide for a minimum of ten hours of light during rearing, gradually increasing up to a maximum of 16 hours per day as the hen's approach peak lay. Correspondingly, this provides for eight hours of sleep each night. Interestingly, a number of farmers spoke about using light to prolong the peak lay by increasing the hours of light at a slower rate than that recommended in the applicable breed standard. Careful monitoring of production records is required to track the increase in laying percentages and if the level of production is on or above the curve, the farmer would refrain from further increases until production starts to drop. If production is sufficient, the flock may not ever move past 14 hours of light per day. However, if the flock encounters challenges later in life for any reason the farmer has the ability to increase the hours of daylight to re-stimulate the laying instinct.

If a flock is experiencing high mortality from smothering or piling in nest boxes as the hens crowd into their favourite nests at the same time, some farmers spoke of starting their lights earlier in the morning to spread out the laying time. At least one also mentioned that the timing of the lights going off the previous night can also have an impact.

An area of considerable uncertainty and disagreement is the use of coloured lighting in laying houses. Some farmers certainly believe that red spectrum lighting can be used to reduce feather pecking and reduce mortalities associated with bullying because the birds are theoretically not able to see blood as easily as they otherwise would. Others seek to achieve the same outcome by simply reducing the intensity of the lighting in the house. Sophisticated lighting systems may provide lighting with variable intensity for a sunrise and sunset effect but a simpler way to achieve a lower intensity is taking out every second or third light bulb or tube. Necessity is the mother of invention and poultry farmers are nothing if not inventive.

On light control, there is potential for a substantial difference between barn and free-range systems. Free range farmers generally use sunset as the primary means of encouraging the hens back inside their house to close them in for their safety during the night. At extreme latitudes, there can be over 18 hours of light each day, so farmers use the sunset as a marker point and try to keep their houses as dark as possible in the morning to ensure the hens get as much rest as possible before they are let out. Cage free houses where the birds are not ranging outside can achieve almost total light control if they are well sealed and designed.

Climate control

Adult chickens have a similar temperature comfort range to humans. No doubt this is part of the reason for the success of the chicken as a domesticated bird. Australians understand that this continent has harsh weather and climate – from extreme heat and large single-day temperature variation to droughts, storms and floods. However, the majority of the country does not experience extreme life-threatening cold or they stay indoors on cold nights. In countries where winter temperatures often sit well below zero, the public generally seem to intuitively understand that free range egg production is not desirable for the hens all year around. Europe and the United States are good examples of markets where free range eggs have a limited market and cage-free or barn eggs are the major alternative to cage eggs. Australia is currently more similar to the UK in this respect: free range eggs are much more popular in the UK than barn eggs.

Whilst the UK is often mocked for its cold weather, typical temperature ranges in most of the country are reasonable for free range hens. Large parts of Australia are also not unreasonable for free range egg production but substantial parts of Australia experience summer maximums over 35 degrees Celsius and that is not a comfortable temperature for hens or humans. Most Australian hen houses have a focus on cooling and ventilation rather than heating. Older houses usually have curtain sides, which are raised and lowered to increase or decrease the flow of air in the house. This system has limitations on stifling hot and still days although it can be combined with misting sprayers and fans to create some air movement. Most recent poultry houses for cage or barn hens utilise what is known as *tunnel ventilation*. This consists of fans at one end of the house pulling air through the house to create a vacuum or tunnel effect. This may or may not be combined with an evaporative cooling system at the other end of the house or a series of misting sprayers inside the house.

This type of ventilation system uses more energy and water than a conventional curtain sided house but will typically result in far greater control over temperature within the house. Opening a substantial number of doors all along the side of a house to allow outdoor access for free range hens makes tunnel ventilation ineffective because the air will primarily be drawn in through the doors closest to the fans and leave hot areas at the other end of the house. There are control systems, which can operate in different modes depending on whether the doors are open or not but essentially they require installation of duplicate cooling systems for the different operating modes. Operating sheds with positive pressure by forcing cool air into the house may be a solution. Europe and the UK do not have a strong focus on cooling, and the US has relatively cheap electricity so they tend to rely on wind speed and chill factor for their cooling.

It is very important for Australian egg farmers to carefully consider the climate and weather in the area where they wish to establish a free-range farm. High mortality or morbidity during hot weather will have a serious effect on the sustainability of a flock. Higher rainfall

may enable year-round grass on the ranging area but it may also be accompanied by a range of health issues due to better growing conditions for both internal and external parasites.

The quality of climate control and ventilation systems in recent years has enabled farmers to place poultry houses almost anywhere in Australia with available power and water (and favourable local councils). In the case of cage and barn houses, there is no reason that this cannot continue. However, farmers need to be conscious that scrutiny of welfare of all systems will only increase into the future and if free range hens are doing poorly due to inherent environmental factors in a particular area, consumers may choose not to pay a premium for those eggs which will limit the farmer's options. It is also likely that welfare accreditation programs will continue to move towards outcome-based assessment rather than merely *paper* auditing to check whether the right boxes on the right forms have been ticked. This is the approach of the RSPCA standards in the UK (RSPCA, 2018) and it is difficult to argue against the idea that welfare is not adequately protected by proscriptive lists of requirements for space and equipment. Bird appearance, production and mortality are better indicators of welfare and if farmers are confident in their ability to properly manage their hens they should not be afraid of outcome-based welfare. The credibility and qualifications of inspectors or auditors would be the primary concern.

Who will manage the alternative systems of the future?

A significant challenge to the management of modern poultry farms in Australia is finding people with the talent for and commitment to the task in regional and semi-remote areas. Even having found a location with adequate power and water, gaining planning approval can be challenging if the site has neighbours. This means that large new farms will inevitably be located further from urban areas and this often reduces the availability of skilled labour.

Whilst most daily tasks on an egg farm do not require formal qualifications, the management of a physical site includes issues like hen and employee welfare, statutory obligations under health and safety legislation, plant maintenance, productivity and environmental impacts. These matters cannot all be monitored and controlled adequately from a central office off-site but require the individual or individuals with responsibility for the daily management of the site to possess certain skills and have acquired a certain amount of education and training in those areas.

The X factor: Stockmanship

Skilled and competent managers are not easy to find. However, if in addition to the obvious list outlined in the previous section one further characteristic is sought – stockmanship – then the ideal egg farm manager is as rare as hens' teeth.

Defining and selecting candidates for employment based on the intangible quality of *stockmanship* is difficult but must be borne in mind as the industry continues to expand production in alternative systems to cages. Birds in alternative systems are free to exhibit more of their natural behaviours and this includes anti-social behaviours like bullying and

feather picking. Direct experience in managing and handling hens or other intensive livestock is a factor but not a guarantee of potential ability.

Where will the people come from?

The USA egg industry is facing a major problem. Even if they can afford the cost of physical infrastructure of a substantial conversion from conventional or enriched cages to alternative systems, they face a significant shortage of qualified and talented managers. The Australian egg industry is facing a similar problem, albeit on a smaller scale. Vice President of Production for Herbrucks' in Michigan, Mohamed Mousa, estimates that the USA may require as many as 10,000 people with poultry management skills. There are currently few formal training paths to qualify in poultry management, although agricultural science degrees or veterinarian courses are options. Ten thousand people may not sound like many from a population the size of the USA, but training and skill acquisition does not happen accidentally, so most of the large egg production businesses will need to develop strong in-house training programs and actively look for potential candidates.

If the industry conversion to alternative production systems does require several thousand additional skilled workers and managers, Australia's continuing production trend could easily require 500-1,000 additional skilled poultry workers in the next decade.

Fracturing the industry

One of the solutions to the skilled labour shortage in Europe and the UK has been to foster the rise of contract farmers. These arrangements can take many forms. Some contractors effectively rent shed space to and receive a price per dozen from the egg packers but do not pay for the birds or the feed. Some contractors pay for all the inputs and receive different prices based on the specifications of the eggs they produce (depending on egg size and percentages of dirty or cracked eggs). Others are more fully independent, selling their eggs to the highest bidder at the time. The latter model requires a degree of transparency through the supply chain about prices.

All of these models are designed to attract and reward talent, commitment and results from the people at the grassroots level who are actually in direct contact with the hens around the clock. In the UK, one manager commented in passing that the best contractors were mostly ex-dairy farmers. Anecdotally, they consistently achieved higher average production results because they understood livestock and they were especially pleased that they were not as strictly tied to the clock. This contract or independent farmer model certainly exists in Australia and may even be increasingly common for the production of free-range eggs.

The independent contractor model has numerous positive features at the micro level. Farmers who have invested their own resources into setting up housing systems on their own land have significant incentives to ensure the health and welfare of both their hens and the range environment. When there is sufficient competition between packers and processors for the eggs, and retailers are charging prices that recognise the relative cost of

different production systems this whole structure can work very well. The most significant downsides are an increase in the number of parties within the industry who have competing interests and increased supply volatility as more farmers make individual decisions to increase, maintain or reduce their supply in response to price signals from the market.

At the same time, these price signals can also become more complicated as there is an additional layer of businesses that may choose to act as a buffer between unrestricted market forces and the farmers. They may do so for their own reasons relating to institutional experience, reputation, beliefs or forecasts about future supply and loyalty to their farmer-suppliers. There may be other reasons relating to their level of ambition as a business and desire to aggressively expand their market share by guaranteeing additional volume. Their choice to even out the highs and lows of prices can give farmers a false sense of market stability upon which to base supply decisions. Viewed positively, they may also give farmers a secure basis on which to develop a livelihood, which may not be possible otherwise with volatile seasonal cashflows.

Conclusion

There are challenging times ahead for the Australian egg industry. The experiences of egg farmers in other places like the USA, UK and Europe suggest that the technical challenges of alternative egg farming will place a significant strain on the viability of the industry. In particular, the ability to establish and operate significant free-range production that meets, or exceeds, possible future volume and welfare requirements will be difficult. A lack of skilled labour willing to work for wages may see the Australian industry go down the path of the UK and Europe with numerous independent producers supplying large packing businesses and being the masters of their own success or failure. This model does currently exist, but the lack of government subsidies (simply for owning land) makes it much harder to succeed with this model in Australia because those who attempt to do so are far more vulnerable to volatile input costs and seasonal price variations unless they are locked into a long-term favourable egg price.

The egg industry, like all free markets, is prone to cyclical excesses and due to the constant nature of egg production from modern well-managed hens, it is easy for a slight overproduction to result in a significant stockpile of excess production that may not have an outlet for a long time. If farmers get ahead of the demand curve and overproduce on the assumption that cages will be abolished eventually or because they are induced to do so by retailers, there may not be sufficient profitability in the industry to justify the hundreds of millions of dollars that are already invested in it. That would be a disastrous outcome for so many egg farmers and their families but it is not inevitable.

Recommendations

1. Egg farmers should be united in defending the continued use of modern cages for safe, efficient, environmentally sustainable production with low mortality and good bird health outcomes.
2. Consumers should drive the expansion of alternative egg production and, possibly, the retirement of cages. A rapidly implemented increase of 50cm² per bird would be preferable to a moratorium on building cages as it would reduce egg supply and price increases could fund further development of production systems the market is willing to support.
3. Egg farmers should show restraint in expanding into alternative production. Free range farm locations should be chosen with hen welfare and sustainability in mind, and not just economic feasibility at current maximum stocking rates.
4. To maintain consumer confidence in alternative systems, audit standards need to become more outcomes-focused rather than compliance checklists for the protection of farmers.
5. Industry should seek additional flexibility in labelling that eggs may come from multiple systems. Substitute *cage free* for the term *barnlaid* and seek at least two additional system definitions that enable more flexible retail categories in the cage free, aviary or free-range space. This would enable greater price differentiation between products other than on outdoor stocking rates. The term *multiple-tier* should be used to describe aviary systems because the current naming conventions mean nothing to consumers.
6. To improve transparency, product integrity and traceability, eggs should receive a production system code and unique farm identification stamp at their first point of packing. This should only be done in conjunction with the more flexible labelling recommendation above.
7. Invest in rearing facilities that mirror intended production houses in order to reduce behavioural issues that impact on welfare and productivity.
8. Support industry training programs by contributing technical knowledge and staff will be a more efficient alternative to individual businesses investing heavily in their own training programs for stockmen and women.
9. Tell and sell the story. If there are no positive news stories about egg farmers and egg farming, the field is left vacant for those who oppose egg production.

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Plain English Compendium Summary

Project Title: Alternatives to Cage Egg Production Are they all they're cracked up to be?

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Objectives

This report is intended to address the biggest issue facing the industry – viability in the medium to long-term. Objectives included:

- Review how other egg farmers around the world are dealing with the challenges presented by taking hens out of cages.
- What are the positive and negatives of allowing hens more freedom to engage in natural behaviours?
- What happened historically in the developed consumer markets of Europe and USA to bring them to where they are today?
- Identify positive production practices that are common to the best egg operations in the world

Background

The commercial egg industry in Australia is a relatively small community. The biggest producers and buyers of eggs are reasonably well known to each other, either personally or by reputation. Compared to the consolidation that followed egg industry deregulation in the eastern states in the 1990s, for the most part, there are cordial relations between egg farmers.

Research

Countries visited included the United Kingdom (UK), the Netherlands, Germany, Canada and the USA. Previously in 2013, the author had also visited the UK, the Netherlands, Belgium and Germany on a visit specifically relating to cage free egg production. Observations from that trip, whilst not specifically discussed in this paper, were certainly of assistance in providing background to the nature of those markets.

Outcomes

There are challenging times ahead for the Australian egg industry. The experiences of egg farmers in other places like the USA, UK and Europe suggest that the technical challenges of alternative egg farming will place a significant strain on the viability of the industry. In particular, the ability to establish and operate significant free-range production that meets, or exceeds, possible future volume and welfare requirements will be difficult.

Implications

The egg industry, like all free markets, is prone to cyclical excesses and due to the constant nature of egg production from modern well-managed hens, it is easy for a slight overproduction to result in a significant stockpile of excess production that may not have an outlet for a long time

Publications

Nuffield Australia National Conference, Adelaide, SA. September 2016