



Valuing higher welfare chicken

Making the financial case for more
humane chicken production

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“If you want farmers to improve animal welfare, you have to come up with concrete figures; particularly on what can be achieved in animal welfare improvements, and the efforts, in other words, costs required.”

- Dr Helmut Saatkaamp, lead researcher, Wageningen University

Cover: Chickens on an RSPCA Assured farm. The animals are benefitting from a simple enrichment to peck and explore.

Photo courtesy of RSPCA Assured

Foreword

The pain and stress caused to chickens raised for their meat is rightly putting food producers and retailers under increasing scrutiny. Such scrutiny is challenging and can be difficult for some to embrace. And fears regarding extra production costs involved in higher welfare farming put some companies off doing the right thing.

Our annual ranking tool 'the pecking order', launched in January 2019, revealed how little iconic fast food companies seem to care about chickens. Sadly, the results show an almost universal disregard.

Change for chickens

But times are changing. Consumer awareness of the high price chickens pay for our enjoyment and willingness to pay for higher welfare products are increasing. Companies are starting to respond to this opportunity, just as they have been to create better lives for egg-laying hens.

Forward thinkers from all parts of society are coming together to say, "enough is enough". Over 100 companies have already committed to improving the lives of chickens within the next few years. They recognise the business opportunities created by higher animal welfare standards. They understand that by continuing business as usual they are exposed to significant risk.

A new standard for chicken production

Such mounting pressure means it's time for all businesses to act. The solutions are already available, as highlighted in this report. They allow chickens to grow at healthier, more natural rates. They provide more space, natural light and stimulating environments to keep these inquisitive, lively animals healthy and active. This higher welfare approach to chicken production must become the new standard across the globe.

And with this research, we are showing how these improvements are less costly than some have suggested. By embracing higher animal welfare solutions, companies can reduce risk and increase customer loyalty and their customer base. They will also radically improve the lives of the animals who sit at the very heart of their businesses.

World Animal Protection is ready to help you take action.

Our doors are open for conversation.

Jonty Whittleton

Global campaign head, World Animal Protection

Moving the world for farm animals

From offices in Australia, Brazil, Canada, China, Costa Rica, Denmark, India, Kenya, the Netherlands, New Zealand, Sweden, Thailand, UK and the United States, we move the world to protect animals. During 2018 we gave more than 3 billion animals better lives through our campaigns that focus on animals in farming, animals in disasters, animals in communities and animals in the wild.

Our practical, solution-focussed approaches are mobilising consumers, the food industry, governments, financial institutions and farmers to transform the lives of farm animals. Through our Change for Chickens campaign, launched in 2016, we are working to end the suffering of the world's 60 billion chickens factory farmed for their meat every year.

Photo: Chickens on an East African independent farm. The open sided shed promotes natural light and ventilation.

Photo credit: World Animal Protection/Georgina Goodwin



Executive summary

Consumer demand for higher welfare chicken products in quick service restaurants and supermarkets is increasing worldwide at a rate that producers and retailers cannot ignore. Significantly, consumer willingness to contribute to the costs of higher welfare production solutions is on the rise. This opens up business opportunities for producers and retailers, particularly as the costs of higher welfare indoor farming solutions are far lower than previously projected.^{1,2} Furthermore, the welfare improvements can be easily accommodated in most existing systems.

Researching and meeting demand – worldwide

World Animal Protection 2018 research, tracking trends from 2016, shows a consistent year-on-year increase in public concern regarding the way chickens are produced. It also indicates people's strong interest in buying products from chickens with a good quality of life. More than 60% of chicken consumers surveyed in 14 countries said they would pay more for better quality, higher welfare products.

The initial 2016 World Animal Protection survey revealed 78% of respondents would not buy factory farmed quick service restaurant chicken knowing the animals had suffered serious health problems. More than 7,000 people were surveyed from five markets – Brazil, China, Thailand, The Netherlands and the United States.

To meet consumer demand, over 100 companies are already committed to implementing a higher welfare indoor standard for chickens.³ But despite worldwide interest in better welfare for chickens, these commitments are largely limited to these companies' business operations in North America. This is not enough to fulfil consumer expectations and improve meat chicken welfare worldwide.



An investment worth making – higher welfare solutions

Most of the world's 60 billion chickens farmed for their meat are still confined to cramped, intensive conditions in factory farms that supply the global quick service restaurant industry. Genetically selected to grow fast and develop large, heavy breast muscles – too big for their legs to support – they experience great pain and suffering.

The combination of fast growth and intensive stocking causes serious welfare issues. These include respiratory failure and sudden death, leg problems, broken bones, and skin problems from constant contact with wet and dirty litter.

Poor welfare can also compromise businesses' bottom lines. Losses in the US alone, due to meat-quality issues in breast meat of fast-growing broilers reared intensively are conservatively estimated at US\$200 million per year. This is due to downgraded or discarded product.⁴

The solutions proposed in this report to give factory farmed chickens better lives are simple, effective and backed by robust scientific evidence. They focus on improvements including:

- lower stocking densities of maximum 30 kg/m² (6 lb/ft²), which allow the chickens room to move and spread their wings, to better use enrichment and reduce leg problems
- provision of 'enrichment', – perches or platforms plus grain, hay bales or other materials to peck – all proven to help the chickens fulfil their natural behaviours, and promote activity and health. Floor-based litter is also an essential enrichment for dustbathing, comfort and feather and foot health
- six hours of continuous darkness per day - allowing the birds better development and natural resting time as opposed to shorter, disturbed resting periods – and better illumination during day time hours
- the use of slower-growing birds with proven higher welfare outcomes to avoid the health problems caused by unnatural fast growth

Photo: A typical industrial chicken farm, with each shed containing tens of thousands of chickens.

¹ Lusk, J. L., Thompson, N. M., & Weimer, S. L. (2018). The Cost and Market Impacts of Slow Growth Broilers. *In Press*.

² Elanco Animal Health. (2016). The Sustainability and Impacts of Slow-Growing Broiler Production in the US.

³ <https://welfarecommitments.com/broiler/> last accessed 30 April 2019.

⁴ Gee, K. (2016). Poultry's tough new problem: 'Woody Breast'. *Wall Street Journal*. Sect. Business and Tech, Mar 29. CCLXVII: B1.

Researching and winning together – companies, consumers and chickens

This report based on 2018 research carried out by Wageningen University for World Animal Protection shows how higher welfare farming systems create a win-win-win situation for consumers, businesses, and chickens. The research, the first of its kind, is an economic and welfare analysis of conventional and higher welfare production systems in five markets. These markets are the Netherlands, United States, Brazil, China and Thailand – among the top chicken producers, consumers or exporters globally. Collectively these countries produce more than 26 billion chickens per year.⁵

Our research found that shifting from 'conventional' to higher welfare indoor systems increases production costs by only 6-9 eurocents per kg live weight across the five markets studied. This means an increase of 6.4-13.4% above conventional production costs, which is much lower than increases of up to 49% previously projected by the United States industry.⁶ Willingness to pay reports from target markets in this research show that consumers are willing to pay for higher welfare chicken, potentially absorbing part of the cost increase at retail. In the United States, 41-54% of consumers are prepared to pay a premium of \$0.50 to \$1.00 per lb for slow growth chicken.⁷ A total of 87.5% of Dutch consumers surveyed expressed a willingness to pay on average 50 percent more for higher welfare chicken, which exceeds the real price increase.⁸

A poll World Animal Protection commissioned found 87% of Chinese consumers and 77% of Thai consumers said 'I only buy products where they know the chickens had lived a good quality of life. The price is not important'.

Photo: Chickens on an East African independent farm. The indoor deep litter system is commonplace in this region.

Photo credit: World Animal Protection/Georgina Goodwin



Taking opportunities – tapping customer interest

Increased production costs can also obviously be shared across the value chain by businesses recognising the opportunity to appeal to and develop the rapidly expanding welfare-friendly customer base. This is working effectively in the Netherlands and with some far-sighted quick service restaurant brands in the United States. Elsewhere, surveys commissioned for this report demonstrate untapped consumer interest and market demand.

Furthermore, chicken retail market prices are often manipulated, and are complex, particularly for quick service restaurants. However, most of the quick service restaurant retail price increases expected would most likely be lower than price increases for supermarket chicken. This is because the chicken content and cost in a burger, for example, is only a fraction of the final cost.

The rapid rise of meat alternatives in many markets, and an increasingly discerning consumer base, mean meat companies should find ways to distinguish their meat-based products from others.

Higher animal welfare presents the ideal opportunity to do so. Companies that ignore the importance of improving farm animal welfare will find themselves increasingly uncompetitive as their customers view it as a critical concern.

⁵ FAOstat 2017 data summed for the 5 countries; <http://www.fao.org/faostat/en> last accessed 29 April 2019.

⁶ Elanco Animal Health. (2015). The Sustainability Impacts of Slow-Growing Broiler Production in the US. Released by National Chicken Council, US in 2016.

⁷ Lusk, J. L., Thompson, N. M., & Weimer, S. L. (2018). The Cost and Market Impacts of Slow Growth Broilers. *In Press*.

⁸ Mulder, M., & Zomer, S. (2017). Dutch Consumers' Willingness to Pay for Broiler Welfare. *Journal of Applied Animal Welfare Science*, 20(2), 137-154.

Introduction

Meat chickens are the most farmed land animal on the planet. Globally, more than 60 billion chickens are reared and slaughtered for meat each year. More than two thirds are raised in intensive indoor systems. And these numbers will only increase as intensive production replicates rapidly in emerging markets. Intensive production is also projected to significantly increase in India, Brazil, the United States and China by 2030.

The Netherlands, the United States, Brazil, China and Thailand are among the top chicken producers, consumers or exporters globally. Collectively they produce more than 26 billion chickens per year.⁹ This is almost half the annual global production of chickens; most are still farmed in low welfare intensive systems despite consumer demand to the contrary.

Intensive systems typically feature high stocking densities and barren environments with no natural light. Cages – rows and tiers crammed with as many as 100 birds in a small space, with no access to litter or enrichment – are commonly used in some countries.

The birds' plight is made even worse by genetics. Modern meat chickens are genetically selected to grow fast and develop large, heavy breast muscles, highly valued in some markets. Two companies control industry genetics and determine growth rates of most meat chickens globally. These two companies are a part of the problem, but also have the capacity to be a part of the solution, as they have also developed slower-growing breeds.

The combination of fast growth and intensive indoor environments leads to serious welfare issues. These include: respiratory failure and sudden death; leg problems and skeletal fractures; various skin problems; and the inability to perform key natural behaviours such as perching, pecking and dustbathing.

Poor welfare is not only bad for the birds; it can also cause economic losses for producers. Fractures, skin problems, and other conditions related to poor welfare will often result in rejected or downgraded meat during processing.

Responding to calls for change

In 2016, World Animal Protection commissioned a global survey of chicken consumers from the five markets featured in this report: Brazil, China, the Netherlands, Thailand and the United States. Overall four out of five (78%) consumers said they would not buy chicken from a fast-food chain if they knew it had suffered serious health problems through living in a cramped factory farm. Responses were 78%, 82% and 90% for Thailand, China and Brazil respectively. Yet most consumers are served low welfare chicken from most quick service restaurants globally.

To create change for chickens, World Animal Protection and other animal welfare organisations are engaging producers, food businesses and consumers in initiatives to improve meat chicken welfare globally.



Photo: Chickens on a RSPCA Assured farm. The farm worker is placing a hay bale on the litter. This simple enrichment provides something for the animals to explore and jump on.

Photo courtesy of RSPCA Assured

⁹ FAOstat 2017 data summed for the 5 countries; <http://www.fao.org/faostat/en> last accessed 29 April 2019.

Setting a global standard – creating opportunities

The higher welfare indoor system advocated by World Animal Protection improves welfare, meets consumer expectations and enhances the food industry's reputation regarding food safety and response to customer demand.

This system uses chicken breeds that grow at healthier rates and have better welfare outcomes. Standards involve environments with more space, natural light and 'enrichment' such as materials for perching and pecking to provide stimulation and promote natural behaviours. This in turn helps keep these inquisitive, lively animals healthy. The slower-growing chicken breeds used in these systems are more physically active and suffer less from the stress and pain suffered by their fast-growing counterparts.¹⁰

This report based on 2018 research carried out by Wageningen University for World Animal Protection shows how higher welfare farming systems create a win-win-win situation for consumers, businesses, and chickens. A 26-member investor group, responsible for more than UK£2.5 (US\$3.3) trillion in assets, has focussed on links between farm animal welfare practices, investment opportunities and risks.¹¹

Improving human and animal health and wellbeing

Irresponsible use or overuse of antibiotics are frequently associated with low welfare systems and pose an increased global risk to animal and human health. This is partly due to bacterial resistance arising on farms.¹² *Campylobacter*, one of the most common food-borne bacterial disease agents, is often latent in overcrowded meat chicken systems.

¹⁰ Bokkers E.A.M., Koene P. (2003). Behaviour of fast- and slow growing broilers to 12 weeks of age and the physical consequences. *Applied Animal Behaviour Science* 81: 59-72.

¹¹ <https://www.bbfaw.com/investors/investor-statement/> last accessed 30 April 2019.

¹² O'Neill, J. (2014). Antimicrobial resistance: tackling a crisis for the health and wealth of nations. *Review on antimicrobial resistance*, pp. 1-16. <https://amr-review.org>.

¹³ Shields, Sara, and Michael Greger. (2013). "Animal Welfare and Food Safety Aspects of Confining Broiler Chickens to Cages." *Animals* 3 (2): 386-400.

¹⁴ Julian RJ. (2004). (2004). Evaluating the impact of metabolic disorders on the welfare of broilers. In: Weeks C and Butterworth A (eds.), *Measuring and Auditing Broiler Welfare* (Wallingford, U.K.: CABI Publishing).

¹⁵ Shim MY, Karnuah AB, Anthony NB, Pesti GM, and Aggrey SE. (2012). The effects of broiler chicken growth rate on valgus, varus, and tibial dyschondroplasia. *Poultry Science* 91:62-5.

¹⁶ Stojic M.D., Bessei W. (2009). The effect of locomotor activity and weight load on bone problems in fast and slow growing chickens. *Archiv Fur Geflugelkunde* 73: 242-249.

¹⁷ Welfare Quality® (2009). *Welfare Quality assessment protocol for poultry (broilers, laying hens)*. Welfare Quality Consortium, Lelystad, The Netherlands. The Welfare Quality® assessment protocols propose a set of animal-based and resource based measures to assess broiler welfare under commercial conditions.

¹⁸ RSPCA (2006). Report: Everyone's a winner. How rearing chickens to higher welfare standards can benefit the chicken, producer, retailer and consumer.

¹⁹ Meluzzia A., Fabbri C., Folegattia E., Sirria F. (2008). Effect of less intensive rearing conditions on litter characteristics, growth performance, carcass injuries and meat quality of broilers. *British Poultry Science* 49 (5) 509-515.

²⁰ Kuttappan, V.A., Hargis, B.M., Owens, C.M. (2016). White striping and woody breast myopathies in the modern poultry industry: a review. *Poult. Sci.* 95, 2724-2733.

²¹ Humphrey, T. (2012). *Campylobacter in poultry, an academic review for World Animal Protection*. Liverpool University.

Higher welfare indoor systems can reduce the need for routine use of antibiotics by reducing stress, improving the immunity and health of birds. Litter-based higher welfare systems may reduce *Salmonella* prevalence and improve the digestive health of birds, which prevents food safety risks.¹³ This in turn lowers the health risks to consumers.

Reducing farmed chicken losses

Farm losses associated with sudden death, leg deformities, walking and skin problems are reduced, and capital costs of cages are also avoided through higher welfare practices.^{14,15,16,17} And because slower-growing birds are less likely to suffer fractures, and meat quality issues including woody breast and white striping, producers cut their losses at the processing stage.^{18,19,20} Higher welfare systems also avoid the need for routine practices that further compromise welfare. These practices can include feed restriction of breeders and thinning of meat birds (the removal or culling of part of a flock during the growth cycle).²¹

Benefits to farm workers are also significant. Workers commonly may report they prefer to work on higher welfare farms with contented, active birds and fewer dead, lame or injured birds to pick up daily. This is a highly depressing task the consumer never sees.

Higher welfare also means other savings that are not often talked about. Food-borne illness and resistance to medically important antibiotics are major public costs not fully borne by the poultry industry. The industry must recognise that the problems of food borne illness and antimicrobial resistance (AMR) are linked to low welfare production. The industry must be willing to take responsibility for these problems by adopting higher welfare indoor systems.

Higher welfare chicken sells

Over the past two years, close to 100 food businesses have committed to using chickens from higher welfare indoor suppliers.²² This is in response to engagement with World Animal Protection and other animal protection groups.

However, none of the major quick service restaurants have committed to global higher welfare sourcing to date. This is despite growing worldwide consumer and wider public demand for higher welfare chicken to alleviate animal suffering.

Experience in the Netherlands regarding the retail success of higher welfare chicken and reports from the UK show that when higher welfare chicken is marketed, it sells.²³

A major industry concern regarding higher welfare indoor farming is that production costs increase. But industry predictions for cost increases are often over-estimated. For this report, Wageningen University researchers modelled the costs of improving chicken welfare in indoor farms. They found modelled costs, although increased, are far less than industry projections. They may also be shared or offset along the value chain.

The report does not attempt to project adjustments in retail or point of sale costs, as this is particularly complex for quick service restaurants. In some situations it is distorted by supermarkets.

Photo: Some of the companies that have committed to improve the lives of chickens.



²² <https://welfarecommitments.com/broiler/> last accessed 30 April 2019.

²³ RSPCA UK. 2018 The better chicken commitment.

About the research

This report is the first attempt to systematically quantify the cost increase in a global range of markets for on-farm higher welfare indoor chicken production.

Wageningen University has ensured research objectivity through a peer-reviewed methodology and seeking independent advice where possible.²⁴ The report concludes that increased cost in higher welfare production may also be shared or offset along the value chain.

Setting criteria for higher welfare indoor farms

The on-farm production criteria, used in this research, are central to the higher welfare systems called for in World Animal Protection's global Change for Chickens campaign.

Criteria are:

- no cages or other form of close confinement
- 100% deep litter flooring
- use of a (moderately) slower-growing breed (maximum weight gain 50g/day)
- maximum stocking density of 30kg/m² or 6lb/ft²
- provision of enrichment materials for pecking and perching
- minimum light intensity of 20 lux during light periods
- minimum of six hours of uninterrupted darkness per 24-hour period.

These system changes have been scientifically proven to improve chicken welfare, and the changes and corresponding improvements have been reviewed by researchers over time.

For example: Slower growth in chickens generally creates stronger legs. This in turn leads to more activity and natural behaviour, such as foraging, pecking and perching. Combined light, space, slower-growth genetics and enrichment encourage these activities too; these changes work together to create positive effects on chicken health and welfare.

Such improvements in chicken health and wellbeing are likely to lead to other cost savings to producers too. This can be, for example, through fewer deaths, and reduced need for antibiotics and culls because of fewer incidences of lameness and other health problems. Calculations of these savings are, however, outside the scope of this report.

In-depth information about the criteria can be found within World Animal Protection's Global Higher Welfare Framework.

Photo: Bales of hay are typically used as enrichment in higher welfare farming.



²⁴ Gocsik, Éva, Suzanne D. Brooshooft, Ingrid C. de Jong, and Helmut W. Saatkamp. (2016). "Cost-Efficiency of Animal Welfare in Broiler Production Systems: A Pilot Study Using the Welfare Quality® Assessment Protocol." *Agricultural Systems* 146 (July): 55-69.

The research objectives

To establish

1. Potential production cost increases related to higher welfare production, based on known/actual production costs in five key markets: the Netherlands, the United States, Brazil, Thailand and China.

Wageningen University compared production cost per kg live weight in prevailing 'conventional' systems against 'higher welfare indoor production' systems (defined according to the higher welfare criteria discussed previously). This cost increase is expressed as a monetary value (in eurocents) and % increase per market.

2. Welfare cost efficiency where adequate/reliable welfare data was available (Netherlands, the United States and Brazil).²⁵ Wageningen University used The Welfare Quality Protocol® (2009), which is perceived as the most reliable method to calculate animal welfare in broiler production systems currently. Animal welfare cost-efficiency refers to animal welfare gains in proportion to the cost increase needed to obtain these gains.
3. An indication of consumer demand via willingness to pay polling in those markets not yet studied: Thailand, China and Brazil to complement existing recent published studies in the United States and Netherlands. We outsourced the public tracking willingness to pay research to reputable survey companies. They sampled a representative sample (by gender and age between 16-64) of 1,000 to 2,000 respondents per country in October 2018. Only the featured markets and relevant responses are detailed in this report.

Photo: Chickens on an RSPCA Assured farm. The animals are benefitting from simple enrichments to peck and explore.

Photo courtesy of RSPCA Assured

The economic research approach

An economic research approach, based on that first developed for the Netherlands was used. It was produced by the Business Economics and Livestock Research Groups, Wageningen University Netherlands. The modeling approach uses real costs and welfare data per market wherever possible.

The Research Groups also reviewed published literature and consulted country-based experts or production companies whenever possible.

Full details of the methodology are available in the annex.



²⁵ Welfare cost efficiency was calculated using the [Welfare Quality® Poultry protocol](#), a scientifically-based tool designed to assess animal welfare using four welfare principles (good feeding, good housing, good health and appropriate behaviour), and a set of 12 criteria used as measures of these principles.

Making a winning case for change

Our research uncovered a wealth of opportunities for producers and retailers in all five markets. We found that production cost increases, when shifting from conventional systems to the higher welfare indoor system used for this research are between 6-9 eurocents per kg live weight. This represents 6.4-13.4% of conventional production costs.

Cost increases were proportionally lowest in the Netherlands because the starting welfare standard is highest. And all cost increases are significantly lower than projections from previous research.

Animal welfare cost efficiency, defined as animal welfare gains (improvements) in proportion to the cost increase needed to obtain these gains, was highest in the United States. This means that United States producers will have to pay proportionally less to see welfare gains in higher welfare systems.

Because of geographical differences in systems and costs, we could not compare absolute monetary cost increases between markets.

Consumer attitudes towards paying more

The public in all markets expressed a high willingness to pay for higher welfare products and great concern about farm animal welfare. This willingness has increased between 2016-2018. There is considerable concern around buying meat that has been produced inhumanely. Increasing proportions of respondents indicated a preference only to buy products from chickens that had lived a good quality of life, irrespective of price. On average, more than 60% of chicken consumers surveyed globally (across 14 countries) said they are willing to pay for better quality, higher welfare products.

Table 1: Key relevant results from World Animal Protection 2018 tracking, and comparison from 2016. Random survey by country of people aged 16-64 years, gender balanced.

Questions/results by key market	Brazil 1,020 respondents	China 2,002 respondents	Netherlands 1,007 respondents	Thailand 1,013 respondents	United States 2,000 respondents
'Protecting animals should be a priority in my country'	90%, Increased from 85% in 2016	70% Decreased from 79% in 2016	68% Increased from 56% in 2016	95% Increased from 81% in 2016	78% Increased from 73% in 2016
'Buying meat that has been produced in an inhumane way is not ok.'	94%	88%	85%	90%	81%
'Strongly or moderately agreed that they only buy products where they know the chickens had lived a good quality life, the price is not important -Note overall global average was 71%	72% increasing 1% year on year	87% increasing 5% year on year	60% increasing 4% year on year	77% increasing 7% year on year	65% increasing 4% year on year

Leading the way - the Netherlands, a case study

Investing in chicken welfare; meeting consumer demand

The minimum legal standards for chicken production systems in the Netherlands are determined by EU Council Directives and Dutch national legislation. Approximately 30% of chicken raised for meat in the Netherlands is for local chicken sales (both supermarkets and quick service restaurants). The remaining 70% is for export and is produced to the minimum EU standard.

A combination of favourable social and market conditions in the Netherlands established the New Dutch Retail Standard (NDRS); a moderately higher welfare indoor system, which became effective in 2016.

These conditions included campaigning by local NGO Wakker Dier against retailers selling 'plofkip' (exploding chickens) - those with fast growth rates farmed in conventional intensive systems.

Producers, retailers and other NGOs then collaborated to establish a higher welfare rating system for meat chickens (1 to 3 star). This was accompanied by an increase in consumers' willingness to pay for higher welfare products and supported by major retailers establishing a 'new concept' for the mainstream market chicken.

Conventional, intensively-farmed chicken was then essentially removed from the domestic market with the introduction of the NDRS.

By 2017, 95% of chicken produced for the Dutch market was being reared at the higher standards required by major retailers. The transition to NDRS production for the local market occurred over a period of two years (2014-2016) after a foundation decade, which started in 2004.

Despite an increase in both cost to producers and consumer price for NDRS chicken, producers were compensated and consumption levels have remained stable or slightly increased. This national case demonstrated the average Dutch consumer was willing to pay an additional 22% on top of the original retail price for chicken.

The NDRS exceeds the EU minimum requirement and compares to the higher welfare indoor system, but with a slightly higher stocking density. The NDRS has become the minimum requirement for fresh chicken sold in supermarkets in the Netherlands (and by default most quick service restaurants). It is now considered the 'conventional' way of rearing chickens.

Despite these achievements - there is still scope for improving the lives of chickens in the Netherlands further to meet consumer demand and match willingness to pay.

A 2017 study by economics and business experts Machiel Mulder and Sigourney Zomer assessed Dutch consumers' willingness to pay for higher welfare chicken. It found that on average, Dutch consumers were willing to pay around €6 per 500g of higher welfare chicken. This was close to 150% of the price of conventional chicken at the time of the study. This bodes well for their support of the small price increases involved in switching to the higher welfare indoor system.

And because of the firm foundations already laid, there are lower costs in switching to the higher welfare indoor system compared with all other markets researched for this report.

(A detailed case study on the national transition to NDRS chicken is available from World Animal Protection).

Table 2: Overview of production systems and attributes in the Netherlands

Production system attributes		EU Minimum ²⁶	New Dutch Retail Standard 'Conventional' ²⁷	Higher welfare indoor
Meat chicken type		Fast-growing ²⁸	Slower-growing	Slower-growing
Length growth period		39 days	49 days	49 days
Weight at delivery		2,300g ²⁹	2,400g	2,400g
Growth rate		60.5 g/day	49 g/day ³⁰	49 g/day
Outdoor		No	No	No
Stocking density		42 kg/m ²	38 kg/m ²	30 kg/m ²
Natural light		No	No	Yes
Enrichment		No	Yes	Yes - 2 types of enrichment
	Grain in feed	N.A.	2g/broiler	No
	Straw bales or perches	N.A.	1 bale/1,000 broilers	2 bales/1,000 broilers 2m perch/ 1,000 broilers
Light intensity		20 lux	20 lux	20 lux
Dark period		6 hrs/day	6 hrs/day	6 hrs/day
Floor type		Concrete with litter	Concrete with litter	Litter

Table 3: Production cost and welfare cost efficiency results for the Netherlands

Variable	EU Minimum ²⁶	New Dutch Retail Standard 'Conventional' ²⁷	Higher welfare indoor
Costs in eurocents per kg live weight			
WQ index score	595.2	697.6	778.7
Variable costs	76.5	86.4	91.1
Fixed costs	9.2	12.4	14.1
Total costs	85.7	98.8	105.2
Change in WQ index score	-102.4	-	80.1
Change in total costs	-13.1	-	6.4
Cost-efficiency ratio	7.8	-	12.5

²⁶ European Union. (2007). COUNCIL DIRECTIVE 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production.

²⁷ Kip bij Albert Heijn. Retrieved November 14, 2017, from <https://www.ah.nl/over-ah/meer-doen/dierenwelzijn/kip>.

²⁸ Gocsik, É., Brooshoof, S. D., de Jong, I. C., & Saatkamp, H. W. (2016). Cost-efficiency of animal welfare in broiler production systems: A pilot study using the Welfare Quality® assessment protocol. *Agricultural Systems*, 146, 55-69.

²⁹ Horne, P.L.M. van. (2017). Competitiveness of the EU poultry meat sector, base year 2015; International comparison of production costs. Wageningen, Wageningen Economic Research, Report 2017-005.

³⁰ Ingrid De Jong, personal communication, November 27, 2017.

Counting the costs

The Netherlands is leading the way, but still needs to improve on lower stocking densities:

- The modeled cost of NDRS production is 98.8 eurocents per kg live weight, and the higher welfare indoor system is 105.2 eurocents per kg live weight.
- Projected increase in cost to switch from NDRS to the higher welfare indoor system: 6.4 eurocents per kg live weight or 6.5%.

The welfare cost efficiency ratio is 12.5 (meaning that the Welfare Quality score increases 12.5 points for every additional eurocent of production cost towards NDRS system. This is relatively cost efficient compared to other markets because the NDRS is a better welfare standard to start with.

Photo: Chickens on litter in a Dutch higher welfare farm.
Photo credit: Rob Doolaard – Dierenbescherming



Evaluating other markets

The United States

Consumers supporting slow growth

The National Chicken Council (NCC), the main industry organisation for chicken producers in the United States, has established basic animal welfare guidelines for meat chicken production. There are no federal regulations in the United States to control or safeguard the welfare of animals used in agriculture. It is governed by state legislation, but no legislation on animal welfare exists in any of the three major poultry-producing states (Georgia, Alabama and Arkansas). NCC guidelines were used to define the conventional United States meat chicken production system used in this study.

Within this system, the final weight of the meat chickens is heavier and the length of the growth period is longer than all other markets analysed. This means the suffering of chickens in conventional United States meat chicken systems increases substantially with their weight and age.

Consumer attitudes

Research conducted in the United States in 2017 by agricultural economics expert Jayson Lusk studied consumer willingness to pay for slow-growth chicken.³¹ The study found a link between consumer knowledge of slow-growth (partly higher welfare) chicken and willingness to pay. Fifty four percent of shoppers said they were willing to pay more for slow-growth chicken when they were given information about the benefits to chicken welfare. In addition, 41% were still willing to pay more, even without information on slow-growth chickens.

Consumer willingness to pay premiums for chicken breasts of \$0.46/lb were also researched. When positive information about the benefits of slow-growth chicken was presented, consumers were willing to pay \$0.54/lb more.

In 2017, a chicken breast was retailing at \$3.20/lb therefore the extra \$0.46/lb premium means that customers were willing to pay 14.3% above market price. This willingness to pay and low costs of switching to higher welfare chicken suppliers presents an opportunity for quick service restaurants to market higher welfare to their customers.

How slow-growth chicken is framed and marketed to consumers affects their purchasing decisions. Consequently, there are opportunities for businesses to have the Unique Selling Propositions (USPs) on slow-growth chickens as so few are talking about it in the market place.

United States agricultural economists Jayson Lusk, Nathanael Thompson, and Shawna Weimer (2018) compared the costs of producing slow-growing and fast-growing breeds at a stocking density of 30 kg/m².³² The research modelled 3 different scenarios using slow-growth breeds. One of their models calculated slow-growing chicken production costs when the animals grow over an increased number of days (50 to 54) to obtain the best net returns.

The researchers found that the cost of producing slow-growing chicken was on average 14% higher than the cost of producing conventional, fast-growing chicken in these conditions. They also found that consumer willingness to pay would have to be 8.5% higher to offset this cost increase. The previous willingness to pay study conducted by Jayson Lusk in 2018, found that consumers are willing to pay up to 14.3% more for slow growth chicken. This indicates that consumers in the United States will pay much more than necessary to offset the cost of switching to higher welfare production involving slower-growing breeds and lower stocking densities.

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³¹ Lusk, J.L. (2018). Consumer preferences for and beliefs about slow growth chicken. *Poultry Science*, Volume 97, Issue 12, December 2018, Pages 4159-4166.

³² Lusk, Jayson L, Nathanael M. Thompson, and Shawna L. Weimer. (2018). "The Cost and Market Impacts of Slow Growth Broilers." In Press.

Table 4: Overview of production systems and attributes in the United States

Production system attributes	Conventional The National Chicken Council standard ³⁵	Enriched environment Current Global Animal Partnership Step 2 v3 ³³	Higher welfare indoor
Meat chicken type	Fast-growing ³⁴	Fast-growing	Slower-growing
Length growth period	46 days	46 days	54 days
Weight at delivery	2,700g	2,700g	2,700g
Growth rate	58 g/day	58 g/day	49 g/day
Outdoor	No	No	No
Stocking density	37 kg/m ²	32 kg/m ²	30 kg/m ²
Enrichment	No	Yes	Yes - 2 types of enrichment
Grain in feed	N.A.	At least 1% of total diet	No
Straw bales or perches	N.A.	1 enrichment / 70m ²	2 bales/1,000 broilers 2m perch/1,000 broilers
Natural light	No	No	Yes
Light intensity	5 lux ³⁶	50 lux	20 lux
Dark period	4 hrs/day	8 hrs/day	6 hrs/day
Floor type	Concrete with litter	Concrete with litter	Litter

Table 5: Production cost and welfare cost efficiency results for the United States

Variable	Conventional The National Chicken Council standard ³⁵	Enriched environment Current Global Animal Partnership Step 2 v3 ³³	Higher welfare indoor
Costs in eurocents per kg live weight			
WQ index score	538.3	659.4	778.7
Variable costs	65.0	67.3	72.3
Fixed costs	6.6	7.7	8.4
Total costs	71.6	75.0	80.7
Change in WQ index score	-	121.1	240.4
Change in total costs	-	3.4	9.1
Cost-efficiency ratio	-	35.6	26.4

³³ Global Animal Partnership. (2017, July 3). [Global Animal Partnership's 5-step Animal Welfare Standards for Chickens raised for meat v3.0](#). Retrieved December 7, 2017,

³⁴ Gregory Archer, personal communication, November 27, 2017.

³⁵ National Chicken Council. (2017). [NATIONAL CHICKEN COUNCIL ANIMAL WELFARE GUIDELINES AND AUDIT CHECKLIST FOR BROILERS](#). Retrieved, 8 December, 2017.

³⁶ ADAS UK Ltd. (2016). Comparison of the Regulatory Framework and Key Practices in the Poultry Meat Supply Chain in the EU and USA.

Counting the costs

- The example cost of conventional (NCC standards) production is 71.6 eurocents per kg live weight and the higher welfare indoor system is 80.7 eurocents per kg live weight.
- Projected increase in cost to switch from conventional (NCC) to the higher welfare indoor system: 9.1 eurocents per kg live weight or 7.7%.³⁷
- The welfare cost efficiency ratio is 26.4 (meaning that the Welfare Quality score increases 26.4 points for every additional eurocent of production cost). This is a relatively higher welfare cost efficiency compared to the Netherlands because the United States starting point is lower.

The Global Animal Partnership – a stepping stone to 2024

The research also examined a production system that complied with Global Animal Partnership (GAP) requirements.

GAP is a private, third party auditing programme giving producers the option of becoming certified at six different levels (Step 1- Step 5+). Each level requires incremental commitments to higher welfare production.

This study used the example of a system based on GAP certification Step 2, version 3.0 standard for meat chickens. This aligns with the United States Joint Animal Protection Organization Statement on Broiler Chicken Welfare Issues. The GAP Step 2 production system is a potential 'stepping stone'. It currently allows conventional (fast-growing) breeds, but with lower stocking densities and enrichment. Switching from the United States conventional system to this one incurred an increase of 3.4 eurocents per kg live weight, and is comparatively more welfare cost-efficient.

This important finding should help the industry stagger costs over time towards a full commitment and anticipated market demand by 2024. Because of the time needed to switch to slower-growing birds the GAP Step 2 system will essentially align with the higher welfare indoor system in 2024.

³⁷ The projected cost increase found by this study is notably less than other figures released by the National Chicken Council, based on studies conducted by [Elanco Animal Health](#) in 2016.

Brazil

Better treatment – consumers concern for chicken welfare

Brazil has no legislation on animal welfare at farm level or during transport for poultry. Historically, the poultry industry has been concentrated in southern Brazil because of its subtropical climate, where meat chickens are kept in simple open-sided houses. Due to insufficient grain supply in the south, and increasing grain supply in Brazil's Midwest, meat chicken production rapidly developed in this region.

The open-sided houses have mesh sides covered with curtains along the lengths. The use of tunnel-ventilated systems with exhaust fans at the end of each house is increasing in Brazil. No cages are used. Open-sided houses are considered the 'conventional' system for this study, though fast declining through tunnel-ventilated system use.

Consumer attitudes

A 2017 study surveying Brazilian citizens' opinions and attitudes on-farm animal production systems found most participants – 79% – believed that animals are not treated well in Brazil.³⁸

They also showed a preference for cage-free and free-range systems. This was linked to ethical reasons as well as beliefs about these systems' ability to allow freedom to move and natural behaviours.

And the World Animal Protection tracking surveys between 2016-2018 revealed great concern for animal welfare. For example, in 2018, 90% of Brazilian consumers said that protecting animals should be a priority in their country compared with 85% in 2016. Ninety four percent also said that 'buying meat that has not been produced humanely' is not OK. And 72% strongly or moderately agreed that they only buy products where they know the chickens have had a good quality of life and that the price was not important. This was a 1% increase over 2016. See Table 1 on page 11 for more detail.

Photo: Motorcycles outside a poultry farm in rural Brazil.



³⁸ Yunes, Maria C., Marina A. G. von Keyserlingk, and Maria J. Hötzel. (2017). "Brazilian Citizens' Opinions and Attitudes about Farm Animal Production Systems." *Animals* 7 (10).

Table 6: Overview of production systems and attributes in Brazil

Production system attributes		Tunnel ventilated ³⁹	Production system open sided ⁴⁰ Conventional Brazilian	Higher welfare indoor
Meat chicken type		Fast-growing	Fast-growing	Slower-growing
Length growth period		42 days	42 days	52 days
Weight at delivery		2,600g	2,600g	2,600g
Growth rate		59 g/day	59 g/day	49 g/day
Outdoor		No	No	No
Stocking density		38 kg/m ²	34 kg/m ²	30 kg/m ²
Enrichment		-	-	Yes - 2 types of enrichment
	Grain in feed	Min 60% in feed	Min 60% in feed	No
	Straw bales or perches	No	No	2 bales/1,000 broilers 2m perch/1,000 broilers
Natural light		No	Yes	Yes
Light intensity		5 lux	50 lux	20 lux
Dark period		8 hrs/day	8 hrs/day	6 hrs/day
Floor type		Dirt with litter	Dirt with litter ⁴¹	Litter

Table 7: Production cost and welfare cost efficiency results for Brazil

Variable	Tunnel ventilated	Production system open sided Conventional Brazilian	Higher welfare indoor
Costs in eurocents per kg live weight			
WQ index score	561.1	658.4	778.7
Variable costs	55.1	55.4	61.1
Fixed costs	6.3	8.1	11.2
Total costs	61.4	63.5	72.3
Change in WQ index score	-97.3	-	120.3
Change in total costs	-2.1	-	8.8
Cost-efficiency ratio	46.3	-	13.7

³⁹ Daniella Jorge Moura, personal communication, November 24, 2017.

⁴⁰ Federici, J. F., Vanderhasselt, R., Sans, E. C. O., Tuytens, F. A. M., Souza, A. P. O., & Molento, C. F. M. (2016). Assessment of broiler chicken welfare in Southern Brazil. *Revista Brasileira de Ciência Avícola*, 18(1), 133-140.

⁴¹ Bernardo Gallo, personal communication, December 19, 2017.

Counting the costs

- The example cost of conventional production (open-sided) is 63.5 eurocents per kg live weight, and the higher welfare indoor system is 72.3 eurocents per kg live weight.
- Closed-tunnel ventilated systems were found to cost 61.4 eurocents per kg live weight.
- Projected increase in cost to switch from conventional (open-sided) to the higher welfare indoor system: 8.8 eurocents per kg live weight or 13.4%. As production costs are comparatively low in Brazil, this percentage increase in cost is proportionally higher than other markets.
- The welfare cost efficiency ratio is 13.7 (meaning that the Welfare Quality score increases 13.7 points for every additional eurocent of production cost).

Tunnel vision – Brazilian industry moving backwards for welfare?

Shifting from open to tunnel-ventilated houses has a significant welfare cost (reduced welfare score by 97.3 mostly associated with higher stocking density and lack of light) for the minimal production cost saving of 2.1 eurocents/kg live weight).

This is the first time this worrying trend has been quantified in terms of welfare cost inefficiency (ratio 46.3). The results also show that it is less costly and more welfare cost-efficient to move to the higher welfare indoor system from an open-sided system, which already has lower stocking density and more light. However, the higher welfare indoor system can also be accommodated in a closed tunnel system.

Thailand

Protecting animals – a priority for consumers

The Thai poultry industry is an important player within Asia and a leading exporter of poultry meat. Since 1999 and 2004, animal welfare in Thailand has been part of the Thai government's agenda. Farms need to meet basic government standards based on the GLOBAL GAP 2013 standards. GLOBAL GAP is a business-to-business certification scheme, not a dedicated welfare, or retailer or consumer-facing certification scheme. Fast growth genetics and barren, dark environments persist within the Thai industry.

However, welfare changes are further driven by EU/UK export and retailer welfare certification schemes, which are constantly evolving. No cages are apparently used in Thailand, and systems are all litter based to meet EU requirements.

Consumer attitudes

World Animal Protection tracking surveys between 2016 and 2018 show that Thai consumers have a keen interest and growing concern regarding animal welfare issues.

For example, in 2018, 95% of Thai consumers said that protecting animals should be a priority in their country compared with 81% in 2016. Ninety percent also said that 'buying meat that has not been produced humanely' is not OK. And 77% strongly or moderately agreed that they only buy products where they know the chickens have had a good quality of life and that the price was not important. This was a 7% increase over 2016. See Table 1 on page 11 for more detail.

These findings indicate Thai consumers are likely to pay more for higher welfare chicken and should encourage retailers to provide it.

Photo: Chickens dust bathing on an East Africa independent farm



Table 8: Overview of production systems and attributes in Thailand

Production system attributes		Conventional production system ^{42, 43}	Higher welfare indoor
Meat chicken type		Fast-growing	Slower-growing
Length growth period		41 days	49 days
Weight at delivery		2,400g	2,400g
Growth rate		58 g/day	49 g/day
Outdoor		No	No
Stocking density		34 kg/m ²	30 kg/m ²
Enrichment		No	Yes - 2 types of enrichment
	Grain in feed	N.A.	No
	Straw bales or perches	N.A.	2 bales/1,000 broilers 2m perch/1,000 broilers
Natural light		No	Yes
light intensity		5 lux	20 lux
Dark period		4 hrs/day	6 hrs/day
Floor type		Concrete with litter	Litter

Table 9: Production cost results for Thailand

Variable	Conventional production system	Higher welfare indoor
Costs in eurocents per kg live weight		
Variable costs	71.1	77.5
Fixed costs	5.5	7.1
Total costs	76.6	84.6
Change in total costs	-	8.0

⁴² Horne, P.L.M. van. (2017). Competitiveness of the EU poultry meat sector, base year 2015; International comparison of production costs. Wageningen, Wageningen Economic Research, Report 2017-005.

⁴³ Comparison and some costs provided by Betagro Thailand.

Counting the costs

- Estimated cost of Thai conventional production is 76.6 eurocents per kg and the higher welfare indoor system is 84.6 eurocents per kg live weight. The cost of production in Thailand is higher than Brazil and China, but less than the United States. Consequently, the increased cost of production is a higher proportion (10.4%).
- Projected increase in production cost to switch to the higher welfare indoor system: 8 eurocents per kg live weight or 10.4%.
- The main cost increases to improve welfare were not able to be calculated as reliable welfare scores were not available. It should be noted that the relatively lower stocking density used in Thailand is advantageous.

Looking forward – opportunities via exports and domestically

The Thai chicken industry has a major share and lucrative export market to the EU and UK. This could help offset increased production cost across the industry to ensure the entire domestic production is higher welfare as such markets become established.

Destination markets are starting to require enrichment and natural light, and Thailand raises birds with a comparatively moderate stocking density. Opportunities also exist locally, demonstrated by significant premiums already for higher quality chicken labels.

China

Quality matters

There is no national animal welfare legislation for meat chickens in China, although Shandong province recently enacted poultry welfare legislation. There are, however, basic trade standards that apply to poultry production and processing.

Two different chicken types are used in meat production. These are yellow-feathered chickens (of varying but slower growth rates over 60 to 120 days to around 2kg live weight) and white-feathered chickens (of conventional fast growth genetics).

Most Chinese poultry production involves white (48% in 2017) and yellow meat chickens (42% in 2017) with remaining mixed (yellow and white chickens) and culled egg-layers.⁴⁴ Yellow meat chickens are preferred by Chinese consumers because of aroma and taste. They are characterised by a lower feed conversion ratio, lower weight gain and lower average total slaughter weight compared to white meat chickens.

In China, there is a major shift from yellow to white bird production. This is due to increased productivity of white bird indoor farming, and increased biosafety concerns regarding avian influenza transmission in traditional live poultry markets.

White meat chickens are kept in three types of production systems – litter (floor), net and cage systems. Cage systems feature wire floors and a stocking density of up to 50kg live weight/m². This is considerably higher compared to the stocking density of other production systems.

Net systems involve a perforated plastic floor system and a lower stocking density than caged systems. Stocking density of litter systems in China is slightly higher than Thailand, but lower than in the EU and the United States. For this research, the net system is considered the main conventional system. Comparison with cage systems is also important, given their increase nationally.

Consumer attitudes

World Animal Protection tracking surveys between 2016 and 2018 show that Chinese consumers have a keen interest regarding animal welfare issues.

For example, in 2018, 70% of Chinese consumers said that protecting animals should be a priority in their country. Eighty eight percent also said that 'buying meat that has not been produced humanely' is not OK. And 87% strongly or moderately agreed they only buy products where they know the chickens have had a good quality of life and that the price was not important. This was a 5% increase over 2016. See Table 1 on page 11 for more detail.

These findings indicate Chinese consumers are likely to pay more for higher welfare chicken. This clear consumer desire for meat from chickens who have had a good life should encourage retailers to use suppliers who farm accordingly.

Photo: Chickens in a cage system without any enrichments.



⁴⁴ CN Agri: China Broiler Industry Report. 2017. cnagri.com.

Table 10: Overview of production systems and corresponding system attributes in China

Production system attributes	Litter	Net ⁴⁵	Cage	Yellow chicken	Higher welfare indoor
Meat chicken type	Fast-growing ⁴⁶	Fast-growing	Fast-growing	Slow-growing	Slower-growing
Length growth period	42 ⁴⁷	42	42	100	51
Weight at delivery	2,500g	2,500g	2,500g	2,000g ⁴⁸	2,500g
Growth rate	60 g/day	60 g/day	60 g/day	20 g/day	49 g/day
Outdoor	No	No	No	No	No
Stocking density	35 kg/m ²	30 kg/m ²	50 kg/m ²	20 kg/m ²	30 kg/m ²
Enrichment	No	No	No	No	Yes - 2 types of enrichment
Grain in feed	N.A.	N.A.	N.A.	N.A.	No
Straw bales or perches	N.A.	N.A.	N.A.	N.A.	2 bales/1,000 broilers 2m perch/1,000 broilers
Natural light	No	No	No	Yes	Yes
Light intensity	12 lux ⁴⁹	12 lux	12 lux	20 lux	20 lux
Dark period	4 hrs/day	4 hrs/day	4 hrs/day	8 hrs/day	6 hrs/day
Floor type	Concrete with litter	Net	Wire	Litter	Litter

Table 11: Production cost results for China

Variable	Litter	Net	Cage	Yellow broiler	Higher welfare indoor
Costs in eurocents per kg live weight					
Variable costs	72.8	72.6	69.3	101.0	78.1
Fixed costs	5.8	6.3	7.2	19.3	8.1
Total costs	78.6	78.9	76.4	120.3	86.2
Change in total costs	-0.3		-2.5	41.4	7.3

⁴⁵ Ma Chuang, personal communication, 5 January, 2018.

⁴⁶ USDA. [China - Peoples Republic of Poultry and Products semiannual 2017 - Chinese year of the rooster](#). Retrieved 10 December 2018.

⁴⁷ Peter van Horne, personal communication, 25 March, 2018.

⁴⁸ Jan Cortenbach, personal communication, 3 December, 2017.

⁴⁹ Li Yongming, personal communication 27 January, 2018.

Counting the costs

- The estimated cost of conventional net production is 78.9 eurocents per kg live weight and the higher welfare indoor system is 86.2 eurocents per kg live weight.
- Estimated cost of other systems: 78.6 per kg live weight (litter floor systems), 76.4 per live weight (cage systems) and 120.3 eurocents per kg live weight for the slowest growing yellow chicken litter-based systems.
- Unsurprisingly, the production costs for cage systems are lowest, but according to this modeling only 2.2 eurocents per kg live weight less than Chinese litter-based systems (which are also apparently slightly lower cost than net systems).
- Projected increase in cost of production to switch to the higher welfare indoor system from net floor system: 7.3 eurocents per kg live weight or 9.3 %.
- The main cost increases to improve welfare were not calculated as reliable welfare scores were not available.

Severely affecting welfare – meat chicken farming in cages

There is an alarming increase in cage manufacture, export and use in China to rear meat chickens. Recent sources cite an average of 38% white and 3% yellow meat chickens are raised in cage systems and this is increasing. Up to 65% of white chickens are raised in cages in some provinces of China.⁵⁰

Cage farming causes the chickens extreme suffering and so does not meet consumer desire for chicken meat from higher welfare indoor systems.

It involves severe confinement and restriction of the chickens' activity and natural behaviours. They are unable to forage, perch, dustbathe or avoid negative interactions like pecking and fighting from other birds. This also leads to fear and aggressive behaviour, which causes injury and infections.

Caged systems do not use litter and so the birds are unable to dustbathe. Dustbathing is important for their plumage, digestive health and wellbeing. Litter also protects human health by helping to prevent Salmonella.

The chickens reared within these systems are at greater risk of heat stress and death from poor ventilation, as cages are usually stacked four tiers high. And because the animals are unable to be normally active, their legs are badly affected. More than 50% of birds may have abnormal walking ability due to cages and high stocking density. Reduced bone strength can also lead to more fractures as they are 'harvested' for slaughter.

Caged chickens also endure increased feather loss and foot and claw injuries from the wire or plastic caging/flooring. They are also more susceptible to breast blisters in wire caged systems.

The close confinement, cage structures and tiered layouts also make it extremely difficult to monitor and inspect the birds for health problems. This in turn can lead to excessive antibiotic use in attempts to prevent outbreaks of disease before they arise.

⁵⁰ CN Agri: [China Broiler Industry Report](#) 2017.

Businesses winning globally – giving chickens better lives

“With relatively low costs, you can already take a big step in the direction of better animal welfare. It doesn’t necessarily have to be expensive and it’s not like housing and buildings must be adjusted immediately.”

- **Dr Ingrid C de Jong, senior researcher, animal health and welfare, Wageningen University**

Consumers in five key markets have a clear and increasing interest in the humane production of the chicken meat they want to buy and are willing to pay more for it. This willingness is creating obvious business opportunities for producers and retailers across these markets as production costs are now not as much previously claimed.

The Dutch national case, highlighted in this report, demonstrates that real solutions exist, that constituents and consumers have a meaningful voice and that retail leadership is appreciated for change. It also shows that moving to higher welfare can happen without major losses for the industry as purchase volumes, value and margins can be maintained or increased.

The higher welfare indoor system used in this research is realistic and is scientifically proven to improve the lives of chickens, and so opens the doors to business opportunities worldwide. It gives discerning consumers what they want, and allows producers and retailers higher cost-efficiency than some other higher welfare systems including those with covered verandas or outdoor access. Almost all existing lower welfare systems, except for cages, in all markets researched for this report can be easily adapted to comply with the higher welfare indoor system. The adaptations can be done in ways that result in higher welfare cost-efficiency.

For example, Brazil could convert both open-sided and closed systems to higher welfare and market to new higher welfare labels. And Thailand, already producing with a lower stocking density than most markets researched, can harness the increasing welfare demands by the EU market, to prepare for growing domestic demand.

The financial implications of animal welfare are, of course, not simply limited to production costs. Companies can build their corporate reputation, deepening brand affinity and loyalty, and potentially expanding their customer base by addressing animal welfare concerns.

Higher animal welfare can also be used as a lens to identify new revenue streams through product innovation. There are likely internal benefits too, with staff members – from office staff to farm workers – investing their careers with employers that tackle corporate social responsibilities head on.

Conversely, companies that ignore animal welfare face a multitude of risks. These include reputation and brand damage, consumer boycotts, and, increasingly these days, reduced investor confidence. In short, it pays to improve animal welfare.

And it’s not just business costs that must be considered. It is also important for consumers to understand and for industry to recognise that the full cost of production should be more transparent than it is now.

Claims that conventional intensive farming systems offer greater savings to consumers and retailers are misleading. These systems have animal, environmental, public health and other social costs. Such costs are borne by governments and the public. They must deal with and pay for intensive farming problems caused by food-borne disease, antibiotic resistance, environmental contamination, natural resources depletion and growing obesity.

Additionally, retail price distortions are not transparent to the public. In some markets, certain retailers use chicken as a ‘loss leader’.⁵¹ This is a product that gets consumers in the door, but ultimately costs retailers more to put on the shelf than the cost of sale. This practice and others that distort in-store marketing intentionally mislead consumers and their expectations of higher welfare costs.⁵²

⁵¹ Hammerand, Jim (Jan, 2018). Costco bets big on loss-leading chickens. Bizwomen: Business Journals.

⁵² RSPCA UK. (2018). Better chicken commitment report and comments on Tesco marketing in-store.

Next steps and recommendations

This research shows that producing higher welfare chicken is likely to be more cost-efficient than previously indicated. Furthermore, there are multiple business benefits of choosing these progressive systems over factory farms, and opportunities to mitigate risk.

World Animal Protection will use this research to engage constructively with key players in the food sector. We will continue to urge all companies with chicken meat in their product portfolios to commit to sourcing from higher welfare indoor systems. In doing so, they can support the growing consumer public demand for higher welfare chicken globally.

We will also urge those with a role in supporting these industries, such as investment firms, to signal their support for companies acting to improve chicken welfare.

We expect companies to develop a robust animal welfare policy, which sets out:

- the changes they will make to improve the welfare of chickens in their supply chains
- the timeframes involved
- when and how they will report on progress.

Specifically, the following issues need to be addressed.

- **Healthier breeds** – Companies must use chicken breeds that grow at a healthier rate.
- **Freedom to move** – Companies must ensure that chickens have the space to behave more naturally. Cages must never be used.
- **Meaningful environments** – Companies must give chickens the opportunity to enjoy natural behaviours via enrichment. Enrichment includes: perches or platforms and pecking objects, improved lighting programmes and high-quality litter.
- **Humane slaughter** – Companies must ensure that chickens are slaughtered using more humane methods that avoid live shackling and render all animals unconscious before slaughter.

Find out more about World Animal Protection's specific requirements for improving chicken welfare at:

<https://welfarecommitments.com/letters/>

Higher welfare indoor systems must become the new minimum standard for chicken production across the globe, and we are here to help. We look forward to continuing the conversation.

The full economic modeling report or Dutch transition report by Wageningen University can be presented upon meeting with World Animal Protection. Please contact Jonty Whittleton for more information – jontywhittleton@worldanimalprotection.org.

Annex: Detailed economic methodology explained

Step 1: Breaking down systems according to inputs.

A production system includes different inputs or attributes that influence animal welfare, for example genetics, stocking density, lighting, flooring system and enrichment. In calculating welfare cost efficiency, it is important to know, which attributes have greater influence on welfare. System fixed costs (i.e. capital costs – such as cost of housing structures) are calculated on a per area basis.

Table 12: Matrix showing the relationship between system attributes and welfare measures

Welfare measures	A1. Broiler type	A2. Length growth period	A3. Weight at delivery	A4.1 Enrichment – (straw) bales	A4.2 Enrichment - perch	A4.3 Enrichment - platform	A5. % Grain in feed	A6. Stocking density	A7. Natural light	A8. Length dark period	A9. Flock size	A10. Net floor	A11. Wire floor	A12. Litter floor	A13. Light intensity
3.1: Plumage cleanliness		-			+			-							-
3.2: Litter quality		-						-	+	-					-
4.1: Panting	-				-	-		+							
5.1: Stocking density (ease of movement)								-							
6.1: Lameness	-	+	+	-	-	-		+	-	-			+		
6.2: Hock burn	-	+	+		-			+/-		-					+/-
6.3: Foot pad dermatitis	-	-			-		-	+		-				+	-
6.4: Breast blister	-				+			+				+	+		
7.1: Onfarm mortality	-									-					
7.3: Ascites	-									-					
7.5: Septicaemia								-							
7.7: Pericarditis															
11.1: ADT										-	+				
12.1: QBA				+	+	+		-	+	+	-	-	-		+

Step 2: Calculating the welfare influence of each attribute.

In this step, each of the attributes identified in the previous step are analysed regarding how much they influence specific measures commonly used to assess welfare. For instance, lameness, foot-pad dermatitis and mortality. To determine whether an attribute is linked to a specific welfare outcome, and if so, how strongly, researchers analysed published scientific studies reporting linkages between system attributes and welfare outcomes. See Table 13.

There is also a synergistic impact of certain inputs (e.g. genetics, stocking density, light and enrichment), which is mentioned in the report but not used by the model. In other words, we know many of these inputs combine in effect to impact welfare, often working more together than in isolation, however the model does not currently calculate this synergistic impact. So, we may expect that cost projections and welfare efficiency may indeed be better than the results from this project.

Table 13: System attribute (input) and Welfare (outcome) measure linkages applied for the higher welfare production system as an example.

Welfare measures	A1. Broiler type	A2. Length growth period	A3. Weight at delivery	A4.1 Enrichment – (straw) bales	A4.2 Enrichment - perch	A5. % Grain in feed	A6. Stocking density	A7. Natural light	A8. Length dark period	A9. Flock size	A12. Litter floor	A13. Light intensity
3.1: Plumage cleanliness		0.20		0.20	0.20		0.20				0.20	
3.2: Litter quality		0.17					0.33	0.17	0.17		0.17	
4.1: Panting	0.33				0.33		0.33					
5.1: Stocking density (ease of movement)							1					
6.1: Lameness	0.11	0.11	0.11	0.11	0.11		0.22	0.11	0.11			
6.2: Hock burn	0.14	0.14	0.14		0.14		0.14		0.14			0.14
6.3: Foot pad dermatitis	0.11	0.11		0.11	0.11	0.11	0.11		0.11		0.11	0.11
6.4: Breast blister	0.40				0.20		0.40					
7.1: On-farm mortality	0.5								0.5			
7.3: Ascites	0.67								0.33			
7.5: Septicaemia												
7.7: Pericarditis												
11.1: ADT									0.67	0.33		
12.1: QBA				0.22	0.22		0.11	0.11	0.11	0.11		0.11

Step 3: Calculating the welfare influence of each attribute.

The cost of production (and thus cost increases) was calculated for each system in the five markets studied. The cost inputs include variable and fixed costs (the latter discounted over the nominal lifetime of housing infrastructure).

Fixed or capital costs were summarised per housing area (per market). Variable costs such as feed, veterinary care, labor, energy costs, day old chicks and maintenance (per market) were used, and variables related to the birds themselves. These included length of the growth period and daily weight gain conventionally used per market unless otherwise compared.

The anticipated costs of implementing the higher welfare indoor system are modeled, and compared with the prevailing conventional systems and some other systems where relevant per market. Cost increase in a monetary and percentage value are provided per market. The latter is most useful, given the range of currencies in the five markets.

Step 4: Calculating welfare cost efficiency.

The final step is to calculate the estimated welfare gains – welfare costefficiency – expected from changing or adding system attributes. Welfare costefficiency is expressed as a ratio, where the total change in welfare scoring is divided by the total change in costs.⁵³ Larger numbers indicate better welfare costefficiency in switching from conventional to higher welfare indoor systems.

Step 5: Sensitivity analysis.

Given this research is based on a computer model, a sensitivity analysis was also conducted. This process analyses the possible range of cost increases based on the largest variable costs: feed and day-old chicks. This enables some reassurance of the range of realistic cost increases per market. In addition, cost contributions were separated out for the most welfare impacting attributes (in Netherlands, the United States, Brazil); genetics, stocking density and enrichment.

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⁵³ Quantified welfare gains relate to an increase in Welfare Quality scoring. Welfare Quality scoring is done using the validated EU Welfare Quality approach. Over 100 commercial farms were previously reviewed in studies or direct research to inform the WQ scores for Netherlands and Brazil.

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