BROILER CHICKEN CASE STUDY
UK 1: RSPCA FREEDOM FOOD INDOOR FARM

An account of a higher welfare indoor system with slower-growing birds, reduced stocking density and environmental enrichment, including natural light.

RSPCA FREEDOM FOOD INDOOR SYSTEM, LANGALLER FARM, SOMERSET, UNITED KINGDOM

Higher welfare indoor system with reduced stocking densities, natural light and enrichments, including straw bales to encourage active behaviours, and perches.

This is a study of a higher welfare indoor system designed to produce higher welfare chicken at a reasonable price. The system is certified by Freedom Food, an inspection and certification system designed to improve the welfare of farm animals. Freedom Food is owned by the RSPCA, who set its standards. The RSPCA set standards for higher welfare indoor production, as in this example, as well as for free-range and organic systems.

To improve welfare, the RSPCA welfare standards for all systems include specific requirements:

- Use of slower growing breeds which have better welfare outcomes (listed opposite). Parent birds of these breeds are also likely to require less feed restriction;
- Lower stocking densities than are permitted by legislation;
- Environmental enrichment including natural light, bales of straw, perches and pecking objects.

The system has positive welfare outcomes:

- Birds remain much more active throughout life, which is beneficial for leg health and litter quality;
- Lower levels of mortality, hock-burns, footpad dermatitis and lameness;
- High levels of health so that most flocks do not require any antibiotics to treat or prevent disease.

Breed

Robust, slower growing breeds such as those used on this farm are easier to keep healthy. They appear to have good immune systems, reducing the likely need to use antibiotics. Slower growing bones and joints are more likely to form properly before the development of large muscle mass, reducing the risk of infection and lameness.

The lower demands on a bird's metabolism means it is easier for the heart and lungs to keep up. This leaves more energy for exercise and these birds are more active. Their slightly smaller breasts mean their bodies are less top-heavy and it is easier for them to get around. Exercise is good for health and helps to reduce lameness.

RSPCA standards stipulate that breeds of chicken used in the system must not have the genetic potential to grow more than 45g per day on average[1]. This means that it takes at least seven weeks for the birds to reach a slaughter weight of 2.2kg if they are grown with the best feed in optimum conditions.

Slower growth rates are required to reduce the risks of lameness and mortality levels from conditions such as ascites (fluid in the abdomen) and Sudden Death Syndrome (a heart condition). An additional key purpose of this requirement is to reduce the levels of feed restriction required to keep broiler breeders productive and healthy (see below).

Langaller Farm mainly keeps Hubbard JA757s, an active breed with low levels of lameness, which meets RSPCA requirements.

Active breeds of chicken are better able to express the full range of natural behaviours known to be good for mental health. Exercising more is also good for leg health. They are also better able to perch, where perches are provided, which helps reduce the risk of lesions such as hock burns.

JA757 birds competing for a fallen morsel. This breed is particularly active.

Broiler breeders

Broiler breeders supplying Freedom Food systems, photographed in 2003. Hens, who are brown, have feed available ad lib. Males, who are white, are fed once a day.

Male and female broiler breeders are the parents of meat chickens and between them they share the genetics which make their offspring grow fast. The Freedom Food scheme does not monitor the welfare of broiler breeders, but the lower growth rate requirement for their offspring is designed to improve the welfare of their parents.

Some breeds of broiler chicken are bred for fast growth, but it is not a desirable trait in a broiler breeder who needs to maintain health and produce fertile eggs over a longer life-span. Oversized broiler breeders suffer a range of health problems and their fertility is compromised. They need to be fertile to produce eggs for hatching.

A key welfare benefit of using slower growing breeds of broilers is that parent birds require less feed restriction. Moderate weight is maintained in broiler breeders with fast-growth traits by keeping them on a strict diet. Restricting fast growth through limits to food intake is good for production and prevents poor physical health, but the feed restriction causes chronic hunger for broiler breeders. This can result in stereotyped, spot-pecking behaviour, over-consumption of water and in some cases head-pecking. The highest levels of feed restriction are during the rearing phase. These are relaxed during production, especially for females who need additional nutrition to produce eggs. The female parents of the JA757 breed kept on this farm, the JA57, have access to feed throughout their productive lives. The male parents for JA757 birds are standard males who do require feed restriction to avoid ill health and infertility and are therefore only fed once a day.

Female JA57 broiler breeders. This is a dwarf breed with good production of fertile eggs. They can remain fit, healthy and productive without feed restriction during the laying period.

Stocking density

Low stocking densities and enriched environments are good for both physical and mental health.

RSPCA Freedom Food birds are given more space than is required by legislation. The maximum stocking density is 30kg/m^2 for indoor systems which works out at around 14 birds per square metre. This is significantly less crowded than the 39kg/m^2 permitted in Britain[2] and the 42kg/m^2 permitted by the EU Directive[3]. These work out at around 17-19 birds per square metre[i].

Lower stocking densities can improve the environment in many ways:

- Environmental temperatures caused by body heat;
- Humidity caused by evaporation from the birds and related to their activities;
- Ammonia pollution resulting from bird droppings.

This also improves the quality of the litter, so it is less likely to get damp. This reduces the production of ammonia from the decay of the birds' faeces, reducing the risk of breast blisters and hock and footpad burns. Good ventilation is also important for improving litter quality and reducing ammonia levels.

Lower stocking density also improves welfare by giving the chickens space to move around, reducing jostling and facilitating exercise.

[i] Figures for birds per square metre are at a slaughter weight of 2.2kg. All these densities can be higher where thinning is practised.

Environmental enrichment

Enrichments include perches, straw bales and natural light.

JA57 perching.

Colouryield cross birds provided with footballs as pecking objects. In general, edible and destructible pecking objects such as straw bales make the most effective enrichments.

Natural light and space encourage natural behaviours such as this ritualistic sparring. JA757 birds with one JA57 colouryield cross front right.

A more stimulating environment can encourage the birds to be active and display natural behaviours. The environment is enriched through several methods:

- Natural light. A line of double-glazed windows the length of the building encourages greater bird activity. The amount of windowed space provided must be to at least 3% of the total floor area of the building;
- Perches. Chickens naturally perch, though some broiler breeds find this difficult as they get larger and heavier. The provision of perches enables birds to perform this natural behaviour and it helps to keep them away from the litter, so reducing risk of lesions such as hock burns;
- Bales of straw or of Miscanthus also allow birds to perch. It also encourages scratching and foraging behaviour as they dismantle the bales;
- Pecking objects. The provision of footballs or hanging CDs (the CDs have since been replaced by rope) can also give the birds something to do, though the edible objects are the best. The welfare standards recommend brassicas and hanging wooden blocks.

All these enrichments encourage natural behaviour and encourage exercise which is good for leg health.

Welfare outcomes

The purpose of using slower growing breeds, increasing space allowance and enriching the environment is to improve welfare. To be sure this works, welfare outcomes need to be measured. Are the birds more active? Do they walk more easily without painful lameness? Do they suffer less from lesions such as hock burns and footpad dermatitis? Are levels of sickness and mortality reduced?

The RSPCA welfare standards require farmers to monitor a range of welfare outcome measures and set targets for them[4]. These include lameness, back scratches as well as hock burns, footpad burns and breast blisters. Hock and footpad burns are recorded at the slaughterhouse.

Birds on this farm showed good welfare outcomes. The JA757s are highly active, showed low signs of lameness or gait abnormality and no hock or footpad lesions were observed. Mortality levels average 2.5%.

Previous research conducted at farms which are part of the same group indicated low levels of mortality (1.8%) and hock and footpad lesions (3.5% each)[5].

The farm was not using antibiotics currently and the birds appeared to be in good health. This is consistent with other anecdotal evidence that this system requires less antimicrobial use, a powerful positive welfare outcome.

Good welfare outcomes are likely to be a result of a combination of breed, lower stocking density, ventilation and environmental enrichment together with good management.

Exercise is good for all animals and these birds are active. This is partly because slower growth can facilitate well-balanced development and also because it leaves more energy for exercise. It is partly because they have a lower centre of gravity, due to a smaller proportion of breast meat, which facilitates movement. Lower stocking density leaves them space to move around and high levels of light and other enrichments further encourage exercise. All of this exercise in turn is good for leg health which also benefits directly from the slower growth.

Active birds also spend less time in contact with the litter, reducing the risk of lesions such as hock burns. Perching also reduces risk. Anecdotal evidence from a previous farm visit also suggested that litter management is easier with these breeds. This may be due to slower, more efficient digestion. Skin health itself may vary between breeds.

Alternatively, it is also the case that lower stocking density will reduce the moisture and nitrogenous wastes produced by the birds, reducing the amount of ammonia produced by bacteria in the litter. Together these may explain the relatively low levels of hock and footpad burns in this system.

Market

The Freedom Food scheme currently has around 2% of the British chicken market sales[6]. Freedom Food certified indoor chicken is sold at a price intermediate between standard and free-range chicken. In one supermarket visited, it retailed for around 20% per kilo more compared to standard chicken, and around 10% lower than free-range[i]. It is marketed to consumers who are looking for a higher welfare chicken at an affordable price.

The moderately higher retail price helps to cover the cost of production. This is increased by the reduced number of chickens produced per year in each shed. This is partly due to the reduced stocking density and also to the longer time it takes for the slower growing birds to reach slaughterweight. Food conversion efficiency is also slightly less efficient, mainly due to the longer lifespan.

However, the better health of the birds results in cost benefits. According to RSPCA research[7], this includes:

- Lower mortality rate;
- Lower numbers of "dead-on-arrivals" at the slaughterhouse;
- Fewer slaughterhouse rejects;
- A significantly higher percentage of Grade A birds;
- Lower levels of hockburn and footpad burn.

There is evidence also of health benefits for consumers buying chicken to look out for slower growing birds[8]. Altogether, higher welfare production can be profitable. The higher value of the birds at retail also increases the total value of the poultry market.

[i] Prices per kilo for whole chicken in Sainsbury's, Godalming, 24/02/12 were "Basics" £2.39; Standard £2.96; Freedom Food £3.57; Freedom Food corn-fed £3.95; Free-range £4. This group supplies Sainsbury's, though we cannot be sure these chickens did not come from a different supplier.

Future developments

The RSPCA is involved in a welfare outcomes assessment programme called ***AssurWel***[9]. This is in conjunction with the Soil Association, the UK's leading organic association, and the University of Bristol. It is an aim of AssureWel to examine outcome measures for broilers by 2015.

Currently, the producer removes about 20% of the flock for slaughter at 42 days of age, a process called thinning. The RSPCA is considering banning thinning to reduce stress to the animals, but currently permits this to occur once. However, there are specific standards in place to help reduce any stress associated with this practice. Prohibiting thinning would remove stress caused by the additional catching process and preparations for it. Where thinning is not practised, it is usual to start with a lower initial stocking density, so the birds have more space. However, this additional space would increase the cost of production.

The RSPCA is also planning to set requirements for broiler breeder farms in future.

Bale of Miscanthus grass provides a perch and also encourages scratching and foraging behaviours.

SUMMARY

This is a system with benefits for people and chickens which the producers believe is "*a realistic compromise for welfare that is feasible*".

1. **For consumers, it provides a higher welfare bird for a modest additional cost. The added value in the product also helps to support the rural economy.**
2. **For the birds, it means better health and higher welfare in return for a modest reduction in food conversion efficiency.**
3. **For the stockperson, working a system with active birds enjoying higher welfare is a rewarding experience. According to the farmer David Christopher:** "*The benefits to me [means the system is] more pleasant to work with … The birds look better, streets ahead and the pleasure of working with the birds is much greater. Much better welfare".*

   A less intensive system is easier to manage. Lower stocking densities makes it easier to walk around the shed as the birds reach their slaughterweight. Together, they make it easier to inspect the birds. Better bird health means less time picking up bodies or culling sick or lame ones. As one stockman states: "*[there is a] lot less input needed for these*".
4. **The environment inside the shed with natural light and lower levels of ammonia provides a more pleasant environment for people as well as animals.**
5. **Keeping birds healthy through the use of robust breeds in environments which keep stress levels lower has potential benefits for human health. Producers say they** "*very rarely have to give antibiotics*", **suggesting that keeping more of these kinds of breeds in these kinds of system could contribute to strategies for reducing antibiotic resistance. That way essential medications will be better able to continue to work to protect the health of both humans and animals.**
6. **RSPCA welfare standards include stipulations about catching and maximum transport time.**

TABLES

BROILER – DESCRIPTION OF SYSTEM	
Date/Time of visit	**29th November 2011 11.30am**
Farm	Langaller Farm
Farm Type	Higher welfare indoor
Certification scheme	RSPCA Freedom Food
Total number of birds on farm	39,750
Number of birds per shed	13,000
Breed	Mostly JA757
Age of flock on visit	33 days
Feed type/amount/delivery/energy/ protein	*Ad libitum,* pan feeder, pellets' nipple drinkers, pan feeders
FCR (average for this group of RSPCA Freedom Food indoor systems in this area)	1.96
Maximum stocking density	30kg/m^2 (around 17-18 birds/m^2 till 42 days, then reduced by 20% to around 14 birds/m^2 at thinning)
Age and weight at thinning (average GR)	42d at 1.7kg (40.5g/d) Non-segregated around 20% flock removed at thinning
Age and weight at slaughter (average GR)	49d at 2.1-2.2kg (42.9-44.9 g/d)
Mortality and cull rates	Average 2.5% (recorded daily)
Hock burn rates at PMI will need to ask for average information (same for FPD)	None observed. Figures of less than 4% have been documented for this scheme[10].

Foot pad dermatitis rates	None observed. Figures of less than 4% have been documented for this scheme[5].
Other health/welfare problems E.g. Leg problems, Ascites.	None observed. Flock exhibited good walking ability.
Natural behaviours observed	Perching on bales and perches Pecking at straw bales Walking / running / preening / agonistic interaction / meal worm-paper test (+)
Level of activity	Good Move away up to 10m or so as approach
Antibiotic use, risk assessment systems	None used at present
Welfare problems E.g. Aggression, feather pecking	Can get back scratching and wing damage due to flighty nature
Light and dark provision	Natural plus artificial Double glazed windows along length of house. Windowed space to be at least to 3% of floor area. 1h dark at day old rising by around 1 hour per day to 6h dark by 6 days. Reduced to 2 hrs two days before thinning then re-instated. Reduced to 2 hrs dark two days before depopulation. Shutters closed 1 week and depopulation to calm birds; 20 lux maintained.
Ventilation	Fan assisted
Litter	Miscanthus bedding – created by hammer chopper method Good condition
Indoor environmental enrichment	Sloping perches, bales (1.5/1000), toys (footballs)
Number of stockpersons	1 full-time (including maintenance and administration)
Frequency of checking birds and any rules about thoroughness	Scheme requires a minimum of three checks per day. At least one of these checks must be sufficiently thorough to identify any bird showing signs of poor health or injury. Lower stocking densities facilitate this.
Transport to slaughter	17 miles. Double leg catching required. Scheme also permits a maximum 4-hour journey time.
% Dead on arrivals	No figures, but low figures of 0.05% have been reported for the scheme[11].
Market	Whole bird and for portions
Cost/price	Sainsburys charge £3.57 per kilo for Freedom Food indoor birds – Godalming 23.02.12 (25% more than *Standard* and 50% more than *Basic*). Checking prices a year later, the costs were £3.93 per kilo for Freedom Food indoor, 18% higher than *Standard* at £3.33 per kilo and 57% higher than *Basic* at £2.50 per kilo.
Slaughter	Gas stunning

REFERENCES

1 RSPCA, 2011. RSPCA welfare standards for chickens, downloaded 23.02.2012 from http://content.www.rspca.org.uk/cmsprd/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobnocache=false&blobtable=MungoBlobs&blobwhere=1232999422222&ssbinary=true.

2 The Welfare of Farmed Animals (England) (Amendment) Regulations 2010 accessed 23/05/12 at http://www.legislation.gov.uk/uksi/2010/3033/schedule/made covers this measure for England. There is similar legislation in Scotland and Wales, though Northern Ireland permits 42kg/m^2 in line with the EU directive. The EU Directive generally permits 33kg/m^2, with a derogation to allow up to 39kg/m^2,if certain conditions including ventilation provision are provided for and another derogation up to 42kg/m^2, if additional measures including specified mortality targets are met.

3 COUNCIL DIRECTIVE 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production accessed 23/05/12 at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:182:0019:0028:EN:PDF

4 RSPCA, 2011, Op Cit.

5 RSPCA, 2006. Everyone's a winner. Downloaded 23.02.2012 from http://www.rspca.org.uk/ImageLocator/LocateAsset?asset=document&assetId=1232712783750&mode=prd.

6 Meat TradesNews Daily 29 February 2012 accessed 25/05/12 at http://www.meattradenewsdaily.co.uk/news/290212/uk___freedom_food_.aspx.

7 RSPCA, 2006 Op Cit.

8 Compassion in World Farming, 2012. Nutritional Benefits of Higher Welfare Products. http://www.ciwf.org.uk/nutrition

9 http://www.assurewel.org/

10 RSPCA, 2006, Op Cit.

11 RSPCA, 2006, Op Cit.

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UK 1: RSPCA FREEDOM FOOD INDOOR FARM

An account of a higher welfare indoor system with slower-growing birds, reduced stocking density and environmental enrichment, including natural light.

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COMPASSION in world farming
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BROILER CHICKEN CASE STUDY
UK 2: RSPCA FREEDOM FOOD FREE-RANGE FARM

An account of a higher welfare system with slower-growing birds, access to range, reduced stocking density and environmental enrichment indoors, including natural light.

RSPCA FREEDOM FOOD FREE-RANGE SYSTEM, HELLINGHAYES FARM, DEVON, UNITED KINGDOM

Gravel near popholes helps keep range by the house dry. (NB: Some popholes temporarily closed to prevent windy conditions from chilling the chickens.)

This Freedom Food system with outdoor access is designed to produce higher welfare chicken at a reasonable price for a quality market. It is certified by RSPCA Freedom Food, an inspection and certification system designed to improve the welfare of farm animals. Freedom Food is owned by the RSPCA, who sets the standards used by the scheme. There are separate standards for indoor, free-range and organic systems. To be sold as free-range, the system has to meet EU marketing standards[1].

European marketing standards require that free-range chickens have access to open-air runs and that they are not slaughtered until they are at least 56 days old.

Welfare advantages of free-range systems include:

- Additional opportunities to display natural behaviours such as exercising, foraging, dust-bathing and sunbathing;
- Reduced stocking densities in indoor accommodation, especially when some of the chickens are ranging outside;
- Reduced growth rates due to minimum slaughter age requirement can result in better welfare provided slower-growing breeds are used;
- A reduced risk of lameness due to slower growth rates and increased exercise.

RSPCA welfare standards[2] incorporate European rules and add additional welfare requirements of their own including:

- Use of slower growing breeds which are more active, have lower levels of lameness and whose parents are less likely to require feed restriction;
- Additional environmental enrichment in indoor accommodation including minimum levels of natural light, bales of straw, perches and pecking objects;
- The provision of shade and shelter on range;
- Minimum sizes and number of popholes, where chickens can enter or leave the shed.

Range

EU marketing rules require that free-range chickens have access to open-air runs for at least half of their lives. There must be at least one square metre of range per bird and it must be mainly covered by vegetation.

Access to these runs allows birds to perform a range of natural behaviours including scratching for different foods, dust-bathing, sunbathing and exploring their environment. Access to range also encourages exercise and reduces the level of crowding for birds who choose to stay inside.

Ranging is encouraged by the provision of tree cover or herb strips which makes the birds feel more secure, especially if threatened by aerial predators, real or apparent, such as birds of prey and aeroplanes. Chickens are descended from the jungle fowl of Asia, birds which naturally live in woodland with access to cover. Cover also provides shade from the sun and shelter from wind.

We visited Hellinghayes Farm during the early afternoon when it is common for free-range birds to be resting inside. However, we were told that when the popholes are opened in the morning *"they stream out"*. It is normal for free-range chickens to be most active at the beginning and towards the end of daylight hours. Birds normally head inside when it rains. It was raining when we first arrived, but several birds were heading outside after it cleared (see image below).

Breed

EU marketing rules require that birds sold as free-range cannot be slaughtered before the age of 56 days, which should encourage the use of slower-growing breeds. RSPCA welfare standards only permit slower-growing breeds who don't have the potential to grow faster than 45g per day on average. These rules reduce the risk of lameness and of cardiovascular conditions, such as ascites and Sudden Death Syndrome. This requirement also reduces the level of feed restriction required to keep broiler breeders healthy. The female parents of the birds kept on this farm, the JA57s, require little, if any, feed restriction (see Broiler Case Study UK1).

Active breeds such as these are better able to take advantage of free-range conditions. The exercise obtained is in turn good for leg health and mental wellbeing.

Tree cover encourages ranging.

Stocking density

Free-range systems give birds more space inside as they have lower stocking densities.

Space inside increases further when more birds decide to go outside.

Free-range chickens have more space inside as well as being able to range outside. In addition to the requirement for 1m^2 per bird in the outdoor run, EU marketing rules also require lower stocking densities indoors. The maximum stocking density indoors is set at a flat rate of 27.5kg/m^2. In practice, there is additional space per bird indoors whenever some of the birds are ranging outside.

Having extra space means birds are less likely to suffer from high temperatures, humidity and ammonia pollution which can result from overcrowding. It also makes it easier for them to move around without jostling each other. It is also easier for them to reach the popholes when they want to range outside.

Once again, all this better exercise means better leg health, better walking ability and less pain due to lameness.

Environmental enrichment indoors

RSPCA Freedom Food-approved free-range systems have more space inside, have natural light and other indoor enrichments.

Perching is a natural behaviour.

Straw bales provide opportunities for scratching and searching for food.

Pecking objects provide additional stimulation.

The key environmental enrichment is access to outdoor range with tree cover, but RSPCA welfare standards also require that the indoor environment is enriched.

Inside, the birds have access to natural light, straw or miscanthus bales, perches and pecking objects. All of these encourage exercise. The combination of higher light levels indoors with shade outside may also encourage outdoor ranging (sudden changes in light can discourage it).

Providing natural light inside provides a better environment for people as well as for the chickens. Light promotes activity, though too much uneven light can cause problems – sunspots can lead to overcrowding.

The farmer felt that this was a *"good system that works well, windows added give nicer environment for both chickens and [people]"*. Bright sunlight could be a problem, but adding blinds helped diffuse the light: *"The chickens like to sit in the sun"*.

No thinning

Thinning is a process by which part of a flock is caught at a lower weight (e.g. 1.7kg) while the rest are allowed to grow to around 2.2kg.

RPSCA welfare standards do not permit thinning of free-range flocks. Avoiding thinning removes one source of stress for the birds. It also reduces the number of birds placed in the shed at the start, reducing the stocking densities throughout the growing period. Avoiding thinning also reduces the risk of *Campylobacter* in the remaining flock.

Welfare outcomes

One of the main reasons why consumers choose a free-range bird is out of concern for animal welfare. Free-range systems have a higher potential for welfare than indoor systems, but whether this is achieved in practice depends on good management. To be sure that welfare is good, it needs to be measured.

The RSPCA welfare standards require farmers to monitor a range of welfare outcome measures and set targets for them[3]. These include lameness, back scratches and lesions such as hock burns, footpad burns (FPD) and breast blisters, all of which should be minimised. Hock burns and FPD are recorded at the slaughterhouse.

The farm showed good welfare outcomes. At 55 days old, the chickens were highly active, showed low signs of lameness or gait abnormality and FPD, and we didn't observe any lesions. Mortality levels averaged 3-3.5%. Most of the birds showed good walking ability.

At the time of visiting, the farm was not using antibiotics and the birds appeared to be in good health. This is consistent with other anecdotal evidence that this system requires little antimicrobial use, a powerful positive welfare indicator.

Good welfare outcomes are likely to be a result of a combination of breed, lower stocking density, environmental enrichment and access to an outdoor range, together with good management and ventilation.

Exercise is good for all animals and these birds are active. This is partly because slower growth can facilitate well-balanced development and also because it leaves more energy for exercise. It is partly because they have a lower centre of gravity, due to a smaller proportion of breast meat, which facilitates movement. Lower stocking density, high levels of light and other enrichments including access to range further encourage exercise.

Active birds also spend less time in contact with the litter, reducing the risk of hock and FPD. Perching also reduces contact. Anecdotal evidence from a previous visit to a different farm also suggested that litter management is easier with these breeds. This may be due to slower, more efficient digestion or lower stocking density inside. Skin health itself may vary between breeds. Together these may explain the relatively low levels of hock and FPD in this system.

In future, a wider range of welfare indicators will be measured as part of the *AssureWel* project[4], a collaborative project between the RSPCA, the Soil Association and the University of Bristol.

Nutritional benefits of free-range production

Research suggests that meat from slower-growing breeds of chicken and from birds with access to pasture generally contain lower levels of fat. In addition the fat composition itself can be healthier with higher levels of long-chain omega-3 fatty-acids[5].

SUMMARY

This system has benefits for chickens, consumers and producers:

1. **For consumers, it provides a higher welfare bird kept in an outdoor environment at a reasonable cost.**
2. **For the chickens it means a slightly longer life in a higher welfare system with a healthier breed, access to the outdoors and more space and enrichment indoors.**
3. **The added value in the product helps to support the rural economy. Stockpeople benefit since less intensive systems can be easier to manage and higher welfare systems can be a more rewarding experience to run. According to the farmer,** *"this is a good system which works well".*
4. **Keeping slower growing birds with access to the outdoors can produce a bird with less but better fat, likely to be healthier to eat. Low levels of antibiotic use have wider benefits in helping to reduce the development of antibiotic resistance.**
5. **RSPCA welfare standards include stipulations about catching and maximum transport time.**

TABLES

BROILER – DESCRIPTION OF SYSTEM	
Date/Time of visit	**29th November 2011 2pm**
Farm	Hellinghayes Farm
Farm type	Free range
Certification scheme	RSPCA Freedom Food
Total flock size (number on farm)	23,000
Number placed (house size)	5,720
Breed	JA757
Age of flock on visit	55 days
Feed	Pan feeders with mash Nipple drinkers
FCR (average for this group of RSPCA Freedom Food free-range systems in this area)	2.283
Maximum stocking density	27.5kg/m^2 (~12.5 birds/m^2)
Age and weight at thinning (average GR)	No thinning permitted
Age and weight at slaughter (average GR)	56 days at up to 2.14kg (38.2g/d)
Mortality and cull rates	2.36% (to date lost 102 from flock) (1st week mostly) (predator 0.5%) Average 3-3.5% mortality
Hock burn rates	None observed
Footpad dermatitis rates	Mild observed
Other health/ welfare problems E.g. Leg problems, Ascites	None observed Flock clean despite poor weather
Natural behaviours observed	Perching on bales and perches Pecking at straw bales Walking / running / preening / agonistic interaction In / out of popholes when rain eased Drinking from puddles

Level of activity	Good Some ranging but poor weather conditions
Antibiotic use	None used at present
Lighting	Natural plus artificial Double-glazed windows along length of house
Ventilation	Natural, automatic ventilation control (side vents along length of house above windows)
Litter	Wood shavings in good condition
Indoor environmental enrichment	Bales and perches
Outdoor enrichment	Trees (apple trees), nettle patch, banks
Levels of ranging and distribution of ranging	Poor but bad weather. Farmer assured us on good day they range well, on the banks and under the apple trees.
Number of stockpersons	1 full time
Frequency of checking birds and any rules about thoroughness	Standards require a minimum of three checks per day. At least one of these checks must be sufficiently thorough to identify any bird showing signs of poor health or injury. Lower stocking densities facilitate this.
Transport to slaughter (distance)	About 15 miles
Market	Whole bird and also portions
Cost/price (per bird and per kilo)	Sainsbury's charge £4 per kilo for free-range RSPCA Freedom Food chicken - Godalming 23.02.12 (35% more than *Standard* and 67% more than *Basics*). Checking a year later (06.03.2013), the cost was £3.58 per kilo for Freedom Food free-range. This was 43% higher than *Basics* at £2.50 per kilo and 7.5% higher than *Standard* at £3.33 per kilo.
Slaughter	Electrical stunning. Planning to move to biphasic gas stunning.

REFERENCES

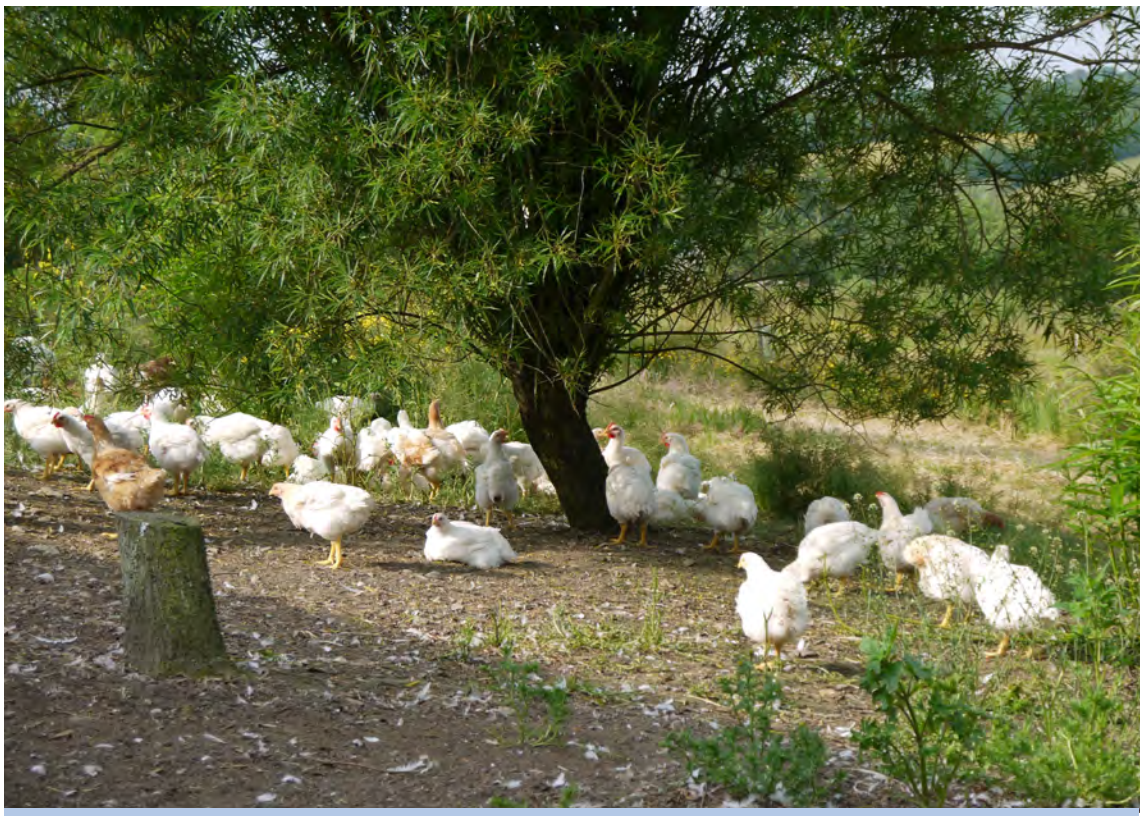
1 COMMISSION REGULATION (EEC) No 1538/91 of 5 June 1991 introducing detailed rules for implementing Regulation (EEC) No 1906/90 on certain marketing standards for poultrymeat accessed 13/7/12 at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1991R1538:20060323:EN:PDF.

2 RSPCA, 2011 entry from RSPCA indoor booklet.

3 RSPCA, 2011, Op Cit.

4 http://www.assurewel.org/

5 Compassion in World Farming, 2012. Nutritional Benefits of Higher Welfare Products. http://www.ciwf.org.uk/nutrition



Tree cover provides shelter and security.

BROILER CHICKEN CASE STUDY
UK 2: RSPCA FREEDOM FOOD FREE-RANGE FARM

An account of a higher welfare system with slower-growing birds, access to range, reduced stocking density and environmental enrichment indoors, including natural light.

Compassion in World Farming

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Hellinghayes Farm

March 2013.

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BROILER CHICKEN CASE STUDY
UK 3: SOIL ASSOCIATION CERTIFIED ORGANIC FARM

An account of a higher-welfare, organic system with slower-growing birds, access to range with reduced stocking density both indoors and outdoors.

COMPASSION in world farming

SOIL ASSOCIATION-CERTIFIED, ORGANIC SYSTEM, HENBERE FARM, DEVON, UNITED KINGDOM

This is a system with outdoor access designed to produce higher welfare chicken at a reasonable price for a niche market. To be sold as organic, the system has to meet EU organic standards[1]. Henbere Farm is certified by the Soil Association, a UK inspection and certification scheme which includes additional sustainability and welfare requirements beyond EU organic rules including welfare outcomes assessment and longer access to a larger range.

Welfare aspects of this organic system include:

- Use of a slower-growing breed with lower risk of welfare problems such as lameness and reduced need to feed restrict parent birds[i];
- Access to range for the last two-thirds of their 70-day lives;
- Small group sizes and moderate stocking densities;
- Rotational system with mobile housing which reduces risk of disease build-up.

Range

Ranging is good for welfare. Access to a varied outdoor environment allows birds to perform a range of natural behaviours including scratching for a variety of foods, exploring, dust-bathing and sunbathing. It also encourages exercise and gives birds more space in the house as fewer will be inside at any one time. Good ranging can also help to reduce the risk of feather pecking which can be a problem in such systems.

Shelter from wind.

Soil Association rules require all table poultry to be kept free-range with access to pasture for at least two-thirds of their lives[2]. In Europe, this is on top of the EU rule which requires poultry to have access to an open area, mainly covered by vegetation, for one-third of their life[3].

This system keeps chickens in relatively small groups of 600 birds. Keeping chickens in smaller groups is one way to help encourage ranging, because in small huts the birds are always close to a pophole they can get out more easily. Because the huts are mobile, they can be moved to new ground after each batch of chickens, so there will be fresh vegetation for them to forage. A downside of rotation is that it is harder to provide good cover from trees and bushes when hens are ranging on fields that will later be used for arable crops.

Good ranging is also encouraged by the choice of a breed which is active and suffers less from lameness and cardiovascular problems.

Rotation ensures that grass is always available fairly close to the sheds. This, together with small group housing and the provision of an outside shelter, all helps to encourage ranging.

i Parent birds of meat chickens are called broiler breeders.

Breed

Choice of breed is key to good welfare. Slower-growing birds are less prone to suffer from lameness, heart problems and fatigue. Parent birds of slower growing breeds are also less prone to suffer from hunger, since less feed restriction is needed to maintain health and production of fertile eggs. Fast- or medium-growing birds are less suitable for organic systems, as they have been bred to rely on a high-protein diet that includes synthetic amino acids to sustain their rapid weight gain. These breeds may show an increased risk of problems such as feather pecking and cannibalism when fed a more natural, organic diet.

EU organic regulations discourage the use of fast-growing breeds by insisting that such birds are reared for a minimum of 81 days before slaughter. Where the farm buys in day-old chicks from a non-organic source, the minimum is 70 days to allow a conversion period to organic, provided that slower-growing breeds are used. Whilst slower-growing birds from an organic source can be killed at any age, in practice, organic birds are nearly always raised for at least 70 days since slower growing birds are normally used. "Slow-growing" in this context is defined by Defra as a bird which doesn't grow more than 45g per day under organic management[4], though the Soil Association's rules are stricter.

The farm uses a cross between a JA57 female and a Colouryield male which produces a slower growing breed, that is commonly used in UK organic systems. This hybrid has a slightly lower growth potential than the JA757 crosses used in the free-range and higher welfare indoor systems (see separate case studies). The cross is highly active and is less likely to suffer from lameness than a fast-growing bird. The female parents (female broiler breeders) do not need to be feed restricted.

The Soil Association has additional rules for breeding flocks insisting that they are kept free-range, are not feed restricted and that they produce hardy offspring of slow-growing types. The Soil Association defines slow-growing as meaning that a bird must not grow more than 35g per day on average according to published breed data, and never more than 60g in a day[5]. However, most organic farms, including this one, have a derogation to use birds of non-organic origin since there is very little supply of organic birds available. This is permitted under EU organic rules provided that the birds spend a minimum of 70 days growing on the organic farm.

Organic broiler breeders from a separate farm.

Stocking density and group size

Stocking density inside the mobile housing is kept lower by good ranging.

Food is provided in the shed.

Chickens need space to perform natural behaviours and organic rules generally restrict stocking densities in the house both to 10 birds and to 21kg per square metre. This means that organic birds generally have more space indoors than those kept in other systems.

However, where birds are kept in smaller groups in mobile housing, such as on this farm, higher indoor stocking densities of up to 16 birds and 30kg per square metre are permitted. This is because small huts offer easier outdoor access for the birds and can be rotated around the farm to provide each flock with fresh pasture. If each flock is reared on a different piece of ground than the previous one, it allows vegetation to recover and reduces the risk of diseases building up.

In this system the birds are kept in groups of 600 at a maximum stocking density of 27.5kg/m^2 which ensures that the system meets EU, free-range standards as well as organic. This means that, if the birds cannot readily be sold as organic, they can also be sold as free-range.

Organic birds get more outdoor space than those in other systems, and Soil Association rules require that the pasture size provides at least 10 square metres per bird. EU organic rules stipulate at least 4 square metres per bird (or 2.5 square metres in small groups with mobile huts), while free-range birds are allocated 2 square metres each.

Disease control with minimum use of antibiotics

In the UK, more than one third of antibiotics used on farm animals are used in poultry[6]. Organic standards are designed to maintain health with minimal use of antibiotics and none had been required by the current flock.

The key to improving health without the use of antibiotics is to use slower-growing breeds with natural disease resistance. Avoiding stressors such as high stocking densities also helps. As previously mentioned, rotation helps to reduce disease build-up in free-range systems.

No thinning

Thinning is a process by which part of a flock is caught at a lower weight (eg 1.7kg) while the rest of the birds are allowed to grow to around 2.2kg.

Organic birds are not usually subject to thinning. This is partly because of the small numbers involved, as many may not be slaughtered before 70 days and also because the organic rules say that they have to be caught at night when they are inside the shed for welfare reasons.

Avoiding thinning removes one source of stress for the birds. It also reduces the number of birds placed in the shed at the start, so stocking densities are lower from the start.

Welfare outcomes

Organic standards are designed so that the system has a high welfare potential. This is the purpose of rules requiring access to range, slower-growing breeds and moderate stocking densities.

However, welfare also depends on good management. To help to ensure that good welfare rules result in chickens with good welfare, the Soil Association has teamed up with RSPCA Freedom Food to measure welfare outcomes under the *AssureWel* scheme[7].

The scheme requires farmers to monitor a range of welfare outcome measures and set targets for them. These include lameness, back scratches and lesions such as hock burns, footpad burns and breast blisters. Hock and footpad burns are recorded at the slaughterhouse.

Environmental aspects

Fitting chickens into the general rotation of the farm ensures that nutrients from chicken dung will be used to help crops to grow in future years rather than presenting a waste problem for the farmer.

Nutritional advantages

Research suggests that meat from slower-growing breeds of chicken and from birds from free-range and organic systems generally contain lower levels of fat. In addition the fat composition itself can be healthier in organic birds with higher levels of long-chain omega-3 fatty-acids[8].

Economic outlook

The poor economic situation has resulted in a reduced demand for organic chicken, to the extent that the farm is reducing the number of flocks reared each year by around a third. Nevertheless, organic production still has a 2% share of the market[9] and it seems likely that in the long run this proportion will rise again as organic meat is valued for its quality, welfare, health and environmental benefits.

SUMMARY

This system has benefits for chickens, the environment, consumers and producers:

1. **For consumers, it provides a higher-welfare bird produced in a system designed to be better for the environment.**
2. **For the birds it means a longer life in a higher-welfare system with a healthier breed kept in smaller groups with access to the outdoors.**
3. **Organic systems can benefit the environment through the use of natural rotations and minimising or avoiding the use of chemicals such as pesticides and artificial fertilisers.**
4. **The considerable, added value in the product helps to support the rural economy, encouraging mixed organic farming systems.**
5. **Keeping slower-growing birds with access to the outdoors can produce a healthier bird with less but better fat, likely to be healthier to eat. Rules preventing routine antibiotic use have wider benefits in helping to reduce the development of antibiotic resistance.**

TABLES

BROILER – DESCRIPTION OF SYSTEM	
Date/Time of visit	**29th November 2011** **3.30pm**
Farm	Henbere Farm
Farm type	Organic
Certification scheme	Soil Association
Total flock size	5,000
Number placed (house size)	600 per mobile ark
Breed	JA57 x Colouryield male
Age of flock on visit	63 days
Feed	Pan feeders with pellets Bell drinkers
FCR (average for all farms in this group of organic farms in this area)	2.72
Maximum stocking density	27.5kg/m^2 inside
Age and weight at thinning	No thinning
Age and weight at slaughter (average GR)	70 days at 2.3kg (32.9g/d)
Mortality and cull rates	Average 5% (NB It should be noted that this is over a longer life-span than in most other systems)
Natural behaviours observed	High ranging post visit
Level of activity	High activity, inquisitive
Antibiotic use, risk assessment systems	None with this flock
Other health problems	Mareks disease
Welfare problems	Footpad dermatitis (FPD) biggest problem
Lighting	Natural light
Ventilation	Natural – side inlet, roof outlet
Litter	Long and chopped straw base plus woodshavings

Indoor environmental enrichment	None (but small group size encourages outside ranging)
Outdoor enrichment	Open pasture range (mobile housing) Sloping fields help drain land Land in good condition – no tracks from vehicles, etc.
Levels of ranging and distribution of ranging	At the time of the visit, the weather was poor for ranging. Once we left, the sun came out and large groups ranged outside!
Biosecurity measures	Disinfected boots and overalls
Number of stockpersons	1
Frequency of checking birds and any rules about thoroughness	Soil Association rules require that birds are checked at least 3 times a day
Transport to slaughter (distance + time)	5 miles
% Dead on arrivals	Usually none
Slaughter	Electric stunning. It is planned to change to biphasic gas stunning.
General notes	Now only restocking after 11 weeks rather than 4 weeks due to market downturn. (The group has reduced from 80,000 organic chickens per week to 20,000). A year after the visit, the market had recovered slightly to allow restocking after 8 weeks following an increase to 30,000 chickens per week. Raises brooders on site. Farmer's view: 'Good chick, good bird'.

REFERENCES

1 European Commission,2007. **COMMISSION REGULATION (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:250:0001:0084:EN:PDF** accessed 21/05/12.

2 Defra, 2010. Guidance document on European Union organic standards http://archive.defra.gov.uk/foodfarm/growing/organic/standards/pdf/guidance-document-jan2010.pdfaccessed 18/03/2013

3 **Soil Association organic standards - farming and growing (Revision 16.6 April 2012)** http://www.soilassociation.org/LinkClick.aspx?fileticket=l-LqUg6iIlo%3d&tabid=353 **accessed 21/05/12**

4 European Commission, 2007, op cit.

5 Soil Association organic standards op cit.

6 At least 34% of total in 2009, excluding antibiotics used for multi-species categories, calculated from VMD, 2010, "Sales of antimicrobial products authorised for use as veterinary medicines, antiprotozoals, antifungals and coccidiostats, in the UK in 2009" downloaded at http://www.vmd.defra.gov.uk/pdf/salesanti09.pdf 02/08/2012.

7 http://www.assurewel.org/

8 Compassion in World Farming, 2012. Nutritional Benefits of Higher Welfare Products. http://www.ciwf.org.uk/nutrition

9 Jackie Linden, 2012, citing figures from the British Poultry Council in "One in Four UK Broilers from Alternative Systems" at http://www.themeatsite.com/meatnews/17194/one-in-four-uk-broilers-from-alternative-systems accessed 23/05/12

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EGG & CHICKEN CASE STUDY
BEIJING *YOU CHICKEN*

Sustainable and organic egg and chicken meat production using a traditional, dual-purpose breed.

COMPASSION in world farming

BEIJING *YOU CHICKEN* PRODUCTION SYSTEM, BAINIANLIYUAN ECO-AGRICULTURE CO LTD, BEIJING, CHINA

INTRODUCTION

The Bainianliyuan Eco-agriculture Co. Ltd supplies organic eggs and meat chickens to Beijing supermarkets. These are produced from Beijing *You Chicken*, also called "oil" chicken, a traditional dual-purpose breed that nearly became extinct in the 1970s. The brand is the second largest of the 20 large companies which sell eggs in the main Beijing supermarkets, representing up to 40% of supermarket sales[1].

The company keeps parent flocks from which they breed the chickens. Both male and female progeny are raised for meat and some females are reared for egg laying. Most of these birds are kept by a co-operative of 320 independent farmers under contract to the company which provides the birds and the feed to the farmers and markets the chickens and eggs. Between them, these farmers rear three million birds each year, including 800,000 laying hens. The parent company also owns a farm which keeps over 100,000 laying hens and 6,000 meat chickens. It was visited twice between 2009-2012 during this study.

110,000 hens on one hillside.

[1] However, most egg sales are not in supermarkets.

Humane sustainable aspects of this farming system are diverse:

- **Organic production of maize for chicken feed**, grown without fertiliser, pesticides or tillage to prevent nutrient leaching into the reservoirs adjacent to the fields that provide part of Beijing's water supply;
- **Anaerobic digestion** of manure produced on the company's farm to provide gas for heating and cooking for farm workers plus 1,000 local homes, whilst reducing risks of disease and environmental pollution;
- **Higher profit margins** per bird and per egg, both for the farmers and the company for a high-value product;
- **Higher welfare potential** in a system which keeps chickens and hens free-range using a traditional breed whose slow growth and moderate egg production puts the birds under less physiological pressure;
- **Use of a dual-purpose breed** means that males of a laying breed are not killed at birth, therefore avoiding waste of both life and resources.

The Beijing *You Chicken*

Also called the Beijing *Oil* chicken due to the appearance of its feathers, the *You Chicken* is a traditional Chinese breed from the area around Beijing which nearly became extinct in the 1970s. It is now one of 50 rare breeds identified for special protection by the Chinese authorities and a breeding nucleus is maintained by the Oil Chicken Institute at the Beijing Academy of Agriculture and Forestry Animal Husbandry and Veterinary Research Institute, which also promotes the breed. Breeding nuclei are also maintained at other Chinese agricultural institutions.

The *You Chicken* is a dual-purpose breed. The males are slow growing and take 120 days to reach a weight of 1.5kg (some are also slaughtered at 0.5kg and 1kg at 60 and 90 days respectively). Whilst slower growth and longer life span reduce Food Conversion Efficiency (i.e. they are less efficient and consume more feed), there is a considerable Chinese demand for this meat which is considered more flavoursome. For example, there is a very substantial market in China for slow growing, traditional "yellow chickens", often kept free-range by small-scale farmers in the south of the country. Chinese consumers will pay a premium for what is locally known as "*Tu*" or "*Earth*" chickens – birds which are kept free-range and/or which taste "*like they used to*".

The hens lay moderate numbers of eggs (around 170 per year), just over half that of modern hybrids, which are also sold at a premium. The eggs and the chickens are marketed with three benefits:

- Taste and quality
- Health
- Social and environmental.

Quality, organic, environmental and health arguments are used to help promote the eggs. The information on the label states that the product is organic, that it is produced from chickens who live free-range on the hills without antibiotics, hormones or genetic modification. Additional information also states that the birds are raised in a healthy place, in the mountains where Beijing's clean water comes from; and that healthy birds produce healthy eggs whereas caged birds are in an unhealthy condition.

Organic maize stalks drying in the sun.

Sustainable feed production

The company farm grows maize, grass and alfalfa, and buys in soya from elsewhere in China to be incorporated into its organic feed. This feed is used both on the company and the co-operative farms.

The maize is grown in fields adjacent to a large reservoir that supplies part of Beijing's water supply. To prevent nutrients and other damaging chemicals from polluting the water, the Beijing authorities have passed a law that includes "7 nos" including no fertiliser, no pesticide and no mechanical tilling[2]. Growing organic feed on this land helps to maintain water quality.

[2] It also includes no construction, no dwelling, no grazing and no tree planting.

Nutrient cycling and energy generation

Anaerobic digesters.

Loading manure for the digester.

It is vital to ensure that manure from the chickens does not spread disease or pollute the environment. All the chicken droppings from the company farm are taken by tractor to the anaerobic digestion plant on site. The fermentation process kills viruses and bacteria as well as producing a more manageable digestate and renewable energy. Surplus grass and maize stalks are also added into the digester to increase the energy available for gas production.

Some of the digestate produced is used to fertilise the fields which grow the grass and alfalfa that are incorporated into the chicken feed, but it cannot be used on the maize fields since the ban on fertiliser use extends to organic fertiliser also. Most of the digestate is used off-site by local farmers to grow fruit and vegetables, including the farm workers on their vegetable plots. The company plans to develop a buying market for its organic fertiliser.

The methane gas generated by the digester is used for heating and cooking on-site by the farm workers and a surplus is sold to 1,000 local families off-site. This provides all their gas needs in summer and contributes to their requirements in winter. This potentially off-sets greenhouse gas emissions from other energy sources and produces low-cost energy.

Power for the street lamps around the company farm are provided by solar panels, although coal is used to provide energy for the rest of the farm.

Socio-economic aspects

Marketing of eggs.

The company buys in parent breeding stock and supplies chicks to the co-operative farmers who are on what is locally referred to as a "co-operative contract". The co-operative farmers pay 3.5RMB[3] per chick, whether male or female, and they also buy feed from the company. In the case of cockerels, these are sold back to the company for about 20RMB depending on size. Eggs are also sold back to the company.

[3] RMB – Chinese currency Renminbi. At the end of 2012, there were approximately 6RMB to the US dollar, 8 to the Euro and 10 to the British pound. 3.5RMB is therefore about 21 US cents, 28 Euro cents and 35 British pence.

Quality markets help to support rural employment. The company farm employs 30 people, including 5 technicians, 24 stockpeople and 1 manager.

We are told the co-operative farmers can make a profit of 2-3RMB per bird compared with around 1RMB profit for an intensively farmed bird. The company can make an additional profit of 20RMB per chicken. The *You Chicken* eggs are also sold for nearly twice the price of standard battery eggs.

Welfare aspects

You Chicken meat and eggs are sold principally on quality and taste, as well as for social and health benefits. Whilst there are clear welfare benefits to the system, this is not at present a key selling point.

This may change. The Chinese *yellow* chicken, often kept free-range by small traditional Chinese farmers, is popular on grounds of quality and taste, but we have seen it on sale in Beijing supermarkets with packaging that extolls the benefits of free-range production. Welfare may become a selling point for Chinese consumers in future.

There are several key welfare features on the company farm and co-operative farms:

- Hens and cockerels are kept free-range in paddocks, well covered with trees and small bushes;
- The hens produce only moderate numbers of eggs, helping them to sustain health through a longer egg-laying period;
- Hens have nest boxes to allow important natural behaviours;
- The slow-growing cockerels are much less likely to suffer from lameness, heart problems and fatigue, all of which are common in intensive broilers;
- Broiler breeders are likely to require little, if any, feed restriction;
- Being a dual-purpose breed, the cockerels also benefit from not being killed at birth, which is the normal fate of males from egg-laying breeds;
- A few cockerels are kept with the laying hen flocks. This provides a more natural social grouping which can be helpful for controlling aggression and feather pecking amongst the hens;
- Forced moulting is not practised, although some hens are kept beyond the first laying season.

Range with tree and bush cover

Trees are grown to provide cover for hens on range.

Pullets on range.

The hens are kept in groups of 2,400-2,500 in sheds 40 x 7 metres in dimension and the cockerels in groups of 3-4,000. This equates to around 9 hens or 11-14 cockerels per square metre. The sheds have a series of pop-holes leading to a large, open range area, significant parts of which are covered with trees and small bushes.

Providing vegetation cover helps the birds to feel secure when ranging outside, since birds are naturally wary of aerial predators. Keeping the hens in relatively small groups in fairly narrow sheds is also good for ranging, possibly because individual birds will not have so many others to get past if they want to go outside. Ranging is good for birds since it keeps them occupied and reduces the risk of feather pecking and cannibalism.

The range also provides opportunities for dust-bathing and foraging. Many birds were observed dust-bathing, which is both a social activity and an opportunity for hens to remove grease from their feathers and discourage parasites. Foraging behaviour was also observed, although the loss of ground cover limited the amount of forage that the birds could obtain outside.

In many western free-range systems, pullets are not kept free-range. Here, the pullets are also kept with access to range from 45 days old. This means that by the time they reach laying age they are used to the system. Learning to range early can result in better ranging later, reducing both stress and the risk of feather pecking.

Use of a robust, dual-purpose breed

The Beijing *You Chicken* is a robust breed with moderate levels of production. The hens produce just over half as many eggs as intensive breeds and the cockerels grow at a quarter of the rate of fast growing broilers.

These lower rates of production protect the birds from a range of health and welfare problems which intensively reared birds are prone to:

- Hens are less likely to suffer from osteoporosis, which can lead to bone breakages;
- Risk of feather pecking may be reduced due to lower nutrient demand;
- Cockerels are much less likely to suffer from fatigue, heart problems, lameness and mortality rates may be reduced.

These advantages particularly suit the *You Chickens* to lower-input, organic diets which are less concentrated in nutrients. Being a dual-purpose breed is also good for the welfare of the cockerels which, instead of being killed shortly after birth, are reared for 60-120 days for meat. There is also evidence from studies elsewhere in the world that eggs and meat from free-range and slower growing breeds are healthier. For example, studies suggest they contain higher quantities of long-chain omega-3 fatty-acids[i].

The hens start to lay at 130-150 days old, continuing to be productive until they are sent for slaughter at around 500 days old (some are kept for longer, until around 700 days). They lay between around 170 eggs per year, compared with over 300 eggs per year for many orthodox commercial breeds. This is partly because many of the birds show brooding behaviours at times, a natural trait which the Oil Chicken Institute is hoping to breed out of them in time.

However, this moderate egg yield has significant potential advantages for welfare, especially in an organic system. The production of large numbers of eggs can put hens under metabolic pressure, especially on a locally-produced, organic diet which has a less precise nutritional formulation. Highly productive hens can leach calcium from their bones in the process of making egg-shells, leading to a higher risk of bone fractures at their most productive period early in lay. Shortage of protein and essential amino-acids due to the requirements of egg production can also increase the risk of feather pecking and cannibalism, as hens turn to each other's bodies as a source of essential nutrients. Many more productive hens also become emaciated *towards* the end-of-lay as body condition deteriorates. This does not happen with the *You Chicken* hens, who are sold at the end-of-lay for meat at a weight of around 2kg – fetching a higher price even than the *You* broilers (hen meat is considered in China to be a particularly nutritious food for nursing mothers).

Producing more sustainable numbers of eggs makes the *You Chicken* suitable for higher welfare and organic systems, since it gives them the adaptability to cope with a varied diet without loss of body condition. Where flocks remain productive, they are sometimes allowed to moult naturally and continue producing until they are 700 days old. This is achieved without forced moulting, a procedure designed to speed up the moulting process when egg production ceases. Forced moulting involves depriving hens of adequate feed and water for a period and causes very poor welfare. It is banned by most organic certifying bodies.

Ranging cockerels.
The provision of cover mimics the natural environment of chickens and encourages ranging.

The cockerels take 60-120 days to reach a slaughter weight of 0.5-1.5kg compared to an intensive bird who can reach 1.5kg in around 30 days. A lower share, or partition of energy and other nutrients to production, leaves more available for balanced growth and exercise. Slow growth gives time for joints, muscles and the cardiovascular system to develop properly in proportion to the rest of the body. The birds are much more active since they are less likely to suffer from fatigue, lameness and heart problems. Robust breeds may also have stronger immune systems, reducing the need for antibiotic use which is common in intensive birds, whereas they are never used for the *You Chicken* cockerels and "very rarely" for the hens.

Cockerel shed. Raised wire platform keep resting birds above their droppings but are not a good substitute for perches.

Compared to the welfare of standard broiler breeders, there are also benefits for the parent birds. Since they don't have the genetics for fast growth, the parent birds can be kept on a diet without the normal feed restriction practised in standard farming (except for a few days around the start-of-lay) without the risk of obesity. Unfortunately, the parent flocks are kept in cages.

Indoor environments

The hens are kept in groups of 2,400-2,500 at a stocking density of around 8.5 birds/m^2. Simple plastic nest boxes are provided for the hens to lay in. We were told very few eggs are laid outside the boxes. The sheds have large unglazed windows which provide ventilation and natural light. The windows are covered with netting and have cloth and plastic covers which can be used to close them up to keep the birds secure at night.

The sheds have a series of pop-holes leading to a large open-range area, significant parts of which are covered with trees and small bushes.

The cockerels are kept in groups of 3-4,000. Stocking densities inside the sheds are around 14 birds/m^2, reduced to 11 for those kept for the full 120 days. This means a maximum of around 18kg/m^2 compared to 25kg/m^2 we have previously been told is standard for intensive farms in China and over 40kg/m^2 for intensive farms in the EU with controlled ventilation. Stocking densities inside are of course lower when part of the flock is ranging outside.

Keeping birds in relatively small groups encourages ranging and lower stocking densities permit birds to move around easily, thus can reduce the build-up of heat, humidity and ammonia. Low stocking densities are also important for systems with cockerels approaching sexual maturity, reducing the risk of aggression or allowing extra space for subordinate birds to escape.

Inside the sheds, the birds are provided with a slightly raised, wire resting area. Whilst perching is natural for birds, this is not a particularly suitable surface. Being raised above the ground will help the birds to keep cool.

There is also a scratching area in the shed, although no litter is provided. Older birds can get out onto the range to scratch and dust-bathe, but the provision of litter inside would be beneficial to encourage natural behaviours, especially for younger birds before they are allowed out at 45 days old. The provision of litter is a requirement in all EU broiler systems.

All sheds have natural light. Two wire platforms are provided for perching. You Chicken hens.

Health and welfare outcomes

Mortality levels for hens range from 3-7%, averaging 4%. The main causes of death are due to predators, feather pecking and cannibalism and sometimes due to suffocation when birds panic and run towards a corner of the shed. Mortality rates of less than 3% are claimed for the cockerels. This compares very favourably with common mortality rates in free-range production.

It is believed that levels of bone fracture are low. Bone fractures are a problem in battery units towards the end-of-lay, since lack of exercise leads to osteoporosis. Fractures are a problem in alternative systems around the peak-of-lay, due to bones being weakened in the process of egg production. Low levels of bone breakage are likely in the *You* birds, as they can exercise and they don't produce unsustainable numbers of eggs. It would be useful if levels of bone breakage were measured.

For meat birds, levels of hock burns and footpad dermatitis (FPD) are said to be very rarely seen (and you would expect FPD to be noticed in a country where chicken feet are eaten as a delicacy). Routine use of antibiotics is not permitted under organic regulations, although they are used therapeutically when necessary for pullets. They are not used at all for the cockerels which, combined with low mortality rates, suggests that levels of health are high.

Improving welfare

Welfare might be improved by the provision of higher perches in the sheds. Perching is a natural behaviour which enables birds to avoid predators whilst resting. Although predators would normally not be able to get into the hen houses, higher perches would help the birds to feel more secure. Hens will naturally choose higher perches if they are provided. They might also enable birds to rest with less risk of feather pecking.

Open nest boxes are provided for laying. It should be noted that hens naturally prefer enclosed nests.

The provision of a foraging and dust-bathing area in the shed, along the middle concrete corridor, could also help welfare. Although it is true that the birds can perform these behaviours outside on range, indoor foraging areas are appreciated by birds, especially in poor weather or before the pop-holes are opened in the morning; indoor foraging areas could also reduce the risk of feather pecking (a displaced foraging behaviour). It would also be beneficial for the welfare of chicks in the first 45 days of life before they have access to the outdoor range.

Provision of enclosed nesting areas would also improve welfare since hens naturally seek out secluded areas in which to nest.

Welfare could also be improved by measuring welfare indicators such as hock burn and FPD in broilers (both said to be low), feather pecking and bone breakages in laying hens. It may well be that all of these are low, but it would be helpful to have figures for this.

Welfare of parent birds could be improved considerably by keeping them in more extensive, higher welfare, cage-free systems.

SUMMARY

This system has benefits for chickens, the environment, consumers and producers:

1. **For consumers it provides eggs and meat which are valued for their higher quality, taste, health and environmental benefits.**
2. **For the birds, it means a life in a higher-welfare system, with a healthier breed, with access to the outdoors. Meat birds also benefit from a longer life.**
3. **Environmental benefits include the avoidance of chemical pesticides and fertilisers as well as the production of renewable energy in the biodigester.**
4. **The added value in the product means higher profit margins for the company and for the farmers.**
5. **Keeping birds with access to the outdoors can improve the nutritional quality of the meat and eggs, especially in relation to fat composition.**

TABLES

BROILER GROWER – DESCRIPTION OF SYSTEM	
Date/Time of visit	24 May 2012
Certification scheme	China Organic Food
Total number of birds on farm	6,000
Number of birds in each group (i.e. shed plus surround) if different	3,000 to 4,000 in each shed
Breed	Beijing *You Chicken*
Feed type/amount/delivery	Self-produced corn and purchased soy
Food Conversion Ratio or FCR (can be worked out from amount of food each bird eats divided by weight of bird at slaughter)	Around 3
Slaughter weight	3 types: 0.5kg slaughtered at 60 days; 1kg at 90 days and 1.5kg at 120 days
Highest stocking density at slaughter (kg/m^2)	For those slaughtered at 60 days, about 14 birds per square metre. For those at 120 days, 11 birds maximum per square metre.
Number of thinnings	None
Mortality and cull rates	Less than 3%
Hock mark rates	Very rarely seen, not recorded
Footpad mark rates	Very rarely seen, not recorded
Other health problems	Very rarely seen, not recorded

Antibiotic use – what percentage of flocks receive some antibiotic treatment	None used
Welfare problems E.g. aggression, feather pecking	Normal dominance behaviour. Cockerels showed some comb damage in consequence, though feather cover was good.
Lighting regimes (throughout life)	Natural light
Litter	None provided
Indoor environmental enrichment Perches, bales, forage, toys	Iron box platforms
Number of stockpersons (person hours per day/week)	A couple will take care of 2 to 3 barns, 8 hours per day
Frequency of checking birds	Very often, including feeding
Transport to slaughter (distance + time)	40km (about 1 hour)
Number of dead on arrival	About 10 birds out of 3000 (0.3%)
Market	Whole birds
Cost/price (per bird and per kilo)	Price for 60-day old, 0.5kg male bird is between 30-40RMB; 90-day old 1kg male bird is between 50-60RMB; 120-day old 1.25kg female bird is 70-80 RMB. The price per end-of-lay hen at 500 days old is 108RMB, but due to good market conditions the price was due to be raised to 198 per bird. Profit per bird 2-3RMB for co-op farmer compared with 1RMB for an intensive bird; company makes 20RMB profit per bird.
Are sexes kept apart or mixed?	Apart
When is access to range provided?	Summer open for the whole day. Winter from 9am to 4pm.

LAYING HENS FARM	
Date/Time of visit	24 May 2012
Certification system	China Organic Food 
Breed (males and females)	Beijing *You Chicken*
Total flock size	105,000
Group size	2,400-2,500
Age when transferred to laying house	45 days
Age at end-of-lay	500 days
No. of eggs per year/production cycle	170
Stocking density at beginning of lay (numbers/m^2)	10 birds per square metre, about 1.25kg each
Feed type	Self-produced corn and purchased soy.
Amount of feed per day per bird	Information not available
Food Conversion Efficiency (FCR)	Information not available
Antibiotic use	The antibiotic used for treatment instead of prevention. Only a "little amount" was used for laying hens 2011-2012.
Veterinary visits	Irregular
Mutilations	None
Mortality and cull rates	No precise figures
Litter	None provided
Indoor environmental enrichment Perches, bales, forage, toys	Iron box platforms
Outdoor environment	Range with tree cover
Rearing environment	As adults. Iron platforms.

Is forced moulting practised?	No
Number of stockpersons (person hours per day/week)	24 stockpersons and 1 manager
Frequency of checking birds	Several times per day
Dead on arrivals	No precise figures, but claimed to be "very few"
Market	Supermarket
Price per egg	Sold for nearly twice the price of standard battery eggs

REFERENCES

[i] Compassion in World Farming, 2012. Nutritional Benefits of Higher Welfare Products. http://www.ciwf.org.uk/nutrition

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