



27<sup>th</sup> February 2018

Lord Gardiner of Kimble  
Parliamentary Under Secretary of State for Rural Affairs and Biosecurity  
Defra  
Nobel House  
17 Smith Square  
London  
SW1P 3JR

Dear Lord Gardiner

**Beak trimming – Biennial report of Laying Hen Welfare Forum**

We welcome the opportunity to provide you with an update on the progress being made by the Laying Hen Welfare Forum (LHWF) and the wider industry to reduce injurious pecking in flocks of laying hens.

As you will remember, the Beak Trimming Action Group (BTAG) was disbanded in March 2016, having fulfilled its remit of reviewing whether beak trimming could be banned in 2016. Ministers accepted all of BTAG's recommendations. They asked the Laying Hen Welfare Forum<sup>1</sup> to take forward the recommendations, with a shift in focus to accelerating the progress to reduce mortality and injurious pecking throughout the laying hen sector, to a point in time that there is sufficient confidence to stop beak trimming.

In this biennial update to you, we have responded to each of the recommendations made by BTAG.

We stress that our primary consideration is to continue to safeguard the welfare of laying hens.

*BTAG Recommendation 1 - A ban on beak trimming of laying hens should not be introduced in 2016, as, on the basis of practical experience and available research, it is considered that this could be detrimental to overall welfare in an unacceptable*

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<sup>1</sup> Members of the LHWF include representatives of industry, veterinarians, RSPCA and government. See Annex A.

*number of laying hens. Compassion in World Farming disagree with this recommendation. They believe that a ban on beak trimming should be introduced in 2016, with an implementation date to be determined by the Secretary of State, based on further reviews of progress.*

The LHWF and the wider industry continues to make progress towards improving feather cover and reducing injurious pecking and mortality with the longer term aim to obviate the need to trim the beaks of day-old chicks using 'Infra-Red' technology. However, we remain of the view that any ban at this time would be detrimental to overall welfare in an unacceptable number of laying hens.

*Recommendation 2 – Producers and the industry as a whole should nevertheless continue to make efforts to avoid the need for beak trimming, particularly by reducing injurious pecking (as in the following recommendations), to the point where there is sufficient confidence to stop beak trimming. This may be achieved in some systems more readily than in others. Progress should be formally reviewed by Government. If significant progress is not being made, then it should consider further formal action, including legislation.*

Existing knowledge is already being disseminated, including previous work carried out by Bristol University, which is being taken forward by some producers on an individual basis. In addition, the LHWF was actively seeking appropriate ways in which to encourage producers to adopt best practice measures to reduce injurious feather pecking and mortality even before BTAG's recommendations were published in November 2015. This led to an application for EIP grant funding in March 2016, which was unfortunately unsuccessful at that time. After submitting a revised application, we are delighted that funding<sup>2</sup> was made available in November 2017, over a three-year period to enable the LHWF to take forward this important work, which will include the appointment of a part-time Project Research Officer. Their role will be to develop bespoke Feather Cover Action Plans (FCAPs) and at the same time monitor feather cover, mortality and injuries attributable to injurious pecking, together with levels of uptake of management strategies. This innovative project will be carried out on 25 trial farms, which are commercially representative in size, and represent all systems of production, on an innovative approach to determine whether the bespoke FCAPs actually deliver reduced feather pecking on farms. The project will build on research evidence and will test the best approaches for commercial implementation and uptake of strategies aimed at reducing injurious pecking in laying hens. Output and experiences from the trials will be disseminated to the wider industry.

*Recommendation 3 – To take forward Recommendation 2, all laying hen producers should draw up bespoke action plans to implement the management strategies drawn up by FeatherWel. BTAG recognises that these management strategies have been incorporated into the latest version of the British Egg Industry Council's (BEIC) Lion Code of Practice and the RSPCA Welfare Standards for Laying Hens (implemented by RSPCA Assured scheme, Freedom Food) and recommends that all laying hen farm assurance schemes should monitor uptake of the management strategies by their*

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<sup>2</sup> RDPE, European Innovation Partnership (EIP) grant; 106330 'Maintaining Feather Cover in Laying Hens'.

*members. RSPCA and Compassion in World Farming members expressed their minority view that the requirement for such action plans should be laid down in legislation.*

We are pleased to be able to report that appropriate intervention strategies from the list produced by the Bristol University 'Feather Pecking Project' have been embraced by Lion Code egg producers<sup>3</sup> (accounting for approx. 90% of UK egg production), with a high level of compliance. Data from 1,266 assessments carried out on Lion laying sites between 1<sup>st</sup> July 2016 and 31<sup>st</sup> December 2017 showed 99.2% compliance. During the same period there was 100% compliance on the 282 pullet rearing farms assessed (source: British Egg Industry Council (BEIC) independent Lion Code assessments). The LHWF is also in contact with other assurance schemes (RSPCA Assured, Laid in Britain, Organic Farmers and Growers, Organic Food Federation and Soil Association). We are also exploring ways in which to ensure that the small percentage of non-affiliated, commercial, hens are included.

*Recommendation 4 - All farm assurance scheme audits/inspections should monitor mortality, feather cover and records of injury attributable to injurious pecking in all laying hen production systems so that producers can benchmark their own performance with previous flocks and identify targets for improvement. Progress should be assessed on a flock-by-flock basis as part of the review of the farm's veterinary health and welfare plan. The aim should be for continuous improvement in mean feather loss scores, using the AssureWel scoring system (already in place in non-cage systems), and injuries attributable to injurious pecking. Failure to make such improvements should be seen as possible non-compliance with the scheme requirements.*

#### BEIC Lion Code of Practice

As part of the BEIC Lion Code of Practice, data is being recorded on: cumulative mortality at 40 and 70 weeks of age (or earlier if the flock is to be depleted before 70 weeks of age); the reasons attributable, where possible, to the mortality; feather cover (using the AssureWel three point scale) at 40 weeks (+/- two weeks) and 70 weeks (+/- two weeks), or time of depletion if earlier. BEIC has prepared an illustrative guide for producers' reference. The new Lion Code database, whereby BEIC Subscribers input the above data for all their registered egg producers, is being trialled. Back-dated data for 2017 is also being collected to provide a baseline upon which progress can be monitored.

#### RSPCA Assured

RSPCA Assured laying hen members receive an AssureWel assessment at every RSPCA Assured audit and every RSPCA Monitoring visit. The assessment includes a standardised and validated feather loss assessment, review of mortality records (at 40 weeks and at end of lay for the previous flock) and assessment of flock flightiness,

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<sup>3</sup> Lion Code of Practice (V7), Sections 5:15 and 6:15; 'To reduce the risk of feather pecking and cannibalism, but particularly in non-beak trimmed birds, producers are recommended to be aware of and implement appropriate intervention strategies from the list produced by the Bristol University Feather Pecking Project'.

(Guidance - 'Auditors to check if Bristol University Feather Pecking Project document is available, and which intervention strategies are being implemented. The website can be found at [www.featherwel.org](http://www.featherwel.org) ').

among other welfare measures. Members are benchmarked against the whole scheme for mortality at 40 weeks and for feather loss (overall and severe). AssureWel

welfare assessments have been in place since September 2011. Benchmarking was introduced in November 2012. RSPCA Assured members are required to maintain a monthly record of feather loss (since September 2013) measured using the AssureWel protocol (since August 2017). Where feather loss falls below given tolerance thresholds (based on AssureWel benchmarking data for the RSPCA Assured scheme), actions must be taken to reduce injurious pecking behaviour and records made of the action taken. These records must be reviewed as part of each farm's Veterinary Health and Welfare Plan.

#### Soil Association Welfare Assessment for Laying Hens:

The Soil Association has the following processes at inspection and guidance within its welfare standards. These include:

- Standards recommend that routine monitoring of the welfare of your animals using welfare outcome measures allows you to recognise problems and identify areas for improvement. Details and guidance is provided in using the feather loss assessment
- Standards detail that if a welfare problem occurs, where feather loss falls below given tolerance thresholds (based on AssureWel benchmarking data), prompt action must be taken, the effectiveness of which must be reviewed and the action altered if necessary. If a welfare problem is found at your inspection, then you must describe what steps you will take to resolve the issue in your Action Summary Form and it will be discussed at the following inspection
- Within the Soil Association revised standards to be issued in 2018, we have included a new range quality and cover standard. The standard details that range must be of a suitable design and actively managed to encourage birds outside and to promote full and extensive use of the range
- Additionally, we are working in a targeted fashion with producers who are struggling to improve feather loss. Helping them to work through bespoke action plans and providing additional guidance and support

Soil Association / Soil Association Certification continues to collect data on interventions as part of the AssureWel welfare outcome assessment protocol.

#### Laid in Britain

'Laid in Britain' accounts for approximately 3% of egg production. Members have been kept up to date with all the Bristol University monitoring advice and recommendations. A record sheet has been provided to record feather loss (using the 0-2 scoring system), and foot scores at 30, 40, 50 and 60 weeks and a column for similar assessment to be made by the independent auditor at the time of the annual audit. There is also provision on the sheet to record any rapid increase in feather loss or cannibalism, with date and age. At this time, it should be recorded that the farm's veterinary surgeon has been notified and details of what corrective action has been taken. LIB has tried to keep the record-keeping as stress-free as possible for producers, whilst still monitoring the aims of recording and improving feather cover. LIB Members are fully conversant with the strategies of the AssureWel and FeatherWel reports and have been asked to adopt those strategies which apply to their own units. LIB record all mortality.

### Organic Food Federation

Federation policy is for inspectors to report excess feather loss that could have been caused by pecking. Any reference to pecking / feather loss in the inspector's report will be taken up with the client and the inspector involved.

### Organic Farmers and Growers

OF&G certify approximately two-thirds of the UK's organic egg laying flock. OF&G contracts the services of Acoura to provide inspectors with the relevant competencies for a wide variety of inspections.

Animal welfare is of utmost importance and inspectors are trained to assess feather loss and injuries attributed to pecking within the flock. Where injuries and feather loss are identified by the inspector, a plan is required to show how this will be alleviated for that particular flock and how this will be avoided in the future. OF&G have also been in discussions with AssureWel on it being able to implement the AssureWel assessments.

*Recommendation 5 – BTAG (or a similar independent body, such as the Laying Hen Welfare Forum) should continue to monitor progress in reducing the incidence of injurious pecking in the national flock. Such a body should report to Ministers on a biennial basis with the results of assurance scheme monitoring of feather cover and mortality attributable to injurious pecking along with updates on the proportion of beak trimmed flocks and uptake of management strategies.*

Following the disbanding of BTAG, the LHWF has taken on the task of providing ministers with the biennial update on progress. The LHWF also has a number of other workstreams in place (in addition to maintaining good feather cover and reducing mortality) which include: synchronicity between rearing and laying farms; novel rearing techniques; reducing keel bone damage; and catching and transport.

*Recommendation 6 - Knowledge transfer aimed at disseminating developing research and practical information to farmers on interventions aimed at reducing the risk and likelihood of injurious pecking should continue. For this to happen, FeatherWel and other resources will need to be updated as new knowledge and findings emerge from a growing body of work around the world, and industry should show a robust commitment to implementation of relevant advice in all production systems. A funding source should be identified.*

Please see our comments under recommendation 2 above relating to the appointment of a Project Research Officer. This role will manage and undertake an agreed programme of research and dissemination activities to improve feather cover of commercial laying hens in all systems of housing. The 25 trial flocks in the project will receive an annual visit during the trial period, with the piloted measurement index being used to score the flocks on the farm to obtain performance data. Farmer-friendly resources will be created for farmers to use on farm to roll out, develop, refine and continually monitor their own bespoke action plans. In addition, several novel approaches to facilitating uptake and implementation of the FCAP will be used with an emphasis on 'hard to reach' farmers.

The measures of success that will be monitored will include: creation of FCAP tailored for each flock and linked to veterinary health and welfare plans; uptake (proportion of planned actions successfully implemented); feather cover of each flock; mortality levels of flocks; flock health and welfare (plus other relevant indicators, where records are available, e.g. feed use and egg output).

There will be liaison with the assurance schemes (Lion Code, RSPCA Assured, Laid in Britain, Soil Association, Organic Farmers and Growers, Organic Food Federation) and with support actors such as veterinary surgeons, advisors and field staff to:

- Use and build on existing knowledge and resources such as the FeatherWel guide and website [www.featherwel.org](http://www.featherwel.org) and Hennovation ([www.henhub.eu](http://www.henhub.eu))
- Develop examples of best practice for maintaining good feather cover in all housing systems and the key strategies of maintaining friable litter (for free range and barn), putting in place rearing strategies for the flock based on the farm's welfare outcome measurements and establishing an active link between flock health and disease and an active veterinary health and welfare plan (VHWP)
- Disseminate videos and descriptions of evidence-based best practices throughout the project on an ongoing basis, including via social media
- Pilot, validate and agree standardised protocols for implementing the recommendations of the Beak Trimming Action Group and collect data (i.e. a Measurement Index for assessing a farm's feather pecking risk, implementing management strategies, monitoring uptake, feather cover and levels of mortality)
- Organise regional roadshows to disseminate the resources, to share best practices to facilitate drawing up and particularly stimulate enacting FCAP's to reduce injurious pecking

We have also set up a website ([www.LHWF.co.uk](http://www.LHWF.co.uk)) to provide a resource platform for farmers and others to use, which we will be widely publicising.

***Recommendation 7** – Industry should continue to consider other approaches to reduce the likelihood of injurious pecking. These could include nutrition, genetics (including choice of white versus brown egg laying strains) and other management and husbandry strategies. The breeding companies should keep up the momentum and make use of genomic technology to accelerate progress to reduce the likelihood of injurious pecking in laying hen strains. It may be appropriate for these approaches to be considered on an EU-wide basis. Further research is warranted into nutritional trigger factors and the impact of dietary changes on the incidence of injurious pecking, and into approaches to reduce injurious pecking through various dietary inputs.*

As with all developments, the more progressive producers tend to take up the available technology and information quickly, whereas others follow more slowly. The requirement for assessment of feather cover in the Lion Code and RSPCA welfare standards is driving positive change, however it needs to be acknowledged that there is not one simple fix to this challenge.

In this section we have included updates received by the genetic breeding companies and nutritionists on the progress being made. The British Veterinary Poultry Association has also provided an update.

### Genetics

*Company A* – continues to work at the pedigree level of their breeding stock to minimise or eliminate the need for beak modification. Their pedigree birds and field analysis birds are never beak-trimmed, therefore they can consistently select individuals within lines and select crosses among different lines that display the best behaviours and interactions between each other. The company's geneticists and bird experts assess feather cover, liveability, and behaviour to continuously improve these traits. All their pure-line birds are fully pedigreed and they place dozens of paternal half-sib daughters together in the same group floor pens and score these families for temperament and feather coverage. The company's commercial stock is recognised for their industry-leading liveability due to low cannibalism, low feather picking and superior feather coverage and it can be directly attributable to this unique family selection technique. The company notes that it appreciates the work that Defra and the BEIC have put into researching beak treatment and feather cover and are looking forward to future collaborations.

*Company B* – notes that, for many years liveability, reduced pecking and good feathering have been high priority in their white and brown layer breeding programmes. They stress that the key words for genetic improvement are 'balanced' and 'time'. It is important this extra attention in the genetic programme has to be balanced with other important traits for performances, sustainability and economics. Knowing that heritability is low, genetic improvements take time and flock management such as nutrition, housing etc., is another key factor to address. The experience in the field with non-beak trimmed flocks is that many stress factors can disrupt the balance and are the triggers for pecking. That is why in this company's breeding programme focus is made on the development of robust birds. In the breeding programme, the pure line families are tested with cross-bred daughter groups in field tests. Several of the field tests are non-beak trimmed. Mortalities per family in the field are recorded. The goal is to select the better living, more social families. This is supported with research on mathematical models, taking into account the indirect effect of the group members. Since 2014, additional feather scoring is implemented in these field tests. Sires with the best offspring for feathering are selected. One of the current projects is the work on beak shape.

Measurements are tested and genetic parameters are calculated to see if there is a genetic basis for beak shape and how to implement this in the breeding programme. All this work is supported by genomic selection, which is implemented in the company's breeding programme.

*Company C* – is conducting trials by not beak trimming two parent flocks (one flock of 15k females and males, and one flock of 19k females and males). It is too early to determine if there has been an increase in mortality, due to the oldest flock being only 32 weeks of age (as at 27<sup>th</sup> February 2018). The company has changed the diets to try and reduce feather pulling by increasing fibre in the diets to over 4%.

*Company D* – in all of this company's breeding programmes, the recording of social behaviour of hens in a group is in addition to the improvement of production traits and egg quality as one of the major breeding goals.

The most important way of capturing phenotypic data for selection decisions is still based on traditional housing of pure line hens in single cages. Of course, in this environment there is no possibility to record social behaviour. Therefore, for over 30 years in this company's breeding farms, there are approximately one third of the pure line population housed in family groups (full sib and half sib families) of 4-7 hens per cage with several repeated groups per family to achieve enough statistical data of successful selection. In these family groups the feather cover is scored 6 times during the life of the birds and morality reasons (cannibalism) are recorded.

In addition to these pure line birds housed in family groups, the company is also testing cross-line birds with known pedigree in commercial farms (multiple age farms for challenge conditions) in family group cages to achieve more information about disease resistance (general liveability) and feather cover under poor feed conditions. These tests are run at present in 4 countries (Spain, Russia, Colombia and Japan).

For more than 30 years, these two ways of testing birds for behaviour (pure line and cross-line in family groups) are performed with non-beak treated hens.

The behaviour traits are not the only breeding targets and in some lines / generations the company is already happy if they can avoid a negative trend instead of making big progress. But selection is always a continuous progress and as non-cage housing systems are getting more and more important, the relative importance of behaviour traits has increased.

As a correlated trait, over the last 5 years the beak shape has been recorded. The length of the upper beak is measured and individuals with a shorter beak are preferred in the selection decisions.

In several European countries (Germany, Austria, Denmark, Sweden), beak treatment is no longer possible. Experiences from these countries show that mortality of hens can be controlled under no beak treatment conditions. However, the feather cover of non-beak treated flocks is clearly worse and much more variable compared to former conditions. And the additional work load for managing flocks can be estimated to be approximately double the time.

Breeding a bird with better social behaviour is a continuous process and can never replace a necessary change in management for non-beak treated flocks.

### Nutrition

In terms of nutrition, there has been growing recognition amongst the industry of the benefits of lower density, higher fibre diets, e.g. use of high protein (Hipro) sunflower to partially substitute for Hipro soyabean meal. These are being increasingly adopted by producers who are concerned about feather cover. Progress here needs to be made gradually as lower density diets run the risk of undersupplying nutrients to the bird, particularly on low feed intakes, which would be counterproductive both for performance

and bird welfare. Breed and feed company advisers continue to educate producers about feeder management to try and minimise the potential for selective feeding. In general, there has been a move towards fewer dietary changes, but rather slight adjustments as today's higher performing birds rarely benefit from 'coming down' in diet

specification, as their higher performance needs supporting with better nutrition. This has primarily been driven by better genetic control of egg size. Producers are also seeking to have diets where there are smaller 'steps down' as they progress through the laying phases. Additionally, there has been a great deal of interest and uptake of provision of alternative 'forage', particularly in the form of Lucerne hay bales, including during the rearing period.

### Veterinary

The British Veterinary Poultry Association supports individual veterinarians working with their layer clients on a feather cover plan as per the government response to the BTAG recommendations and BVPA are happy to disseminate any further initiatives that evolve and are encouraged by the project set up by the LHWF.

Veterinarians take a holistic approach to improving layer health and welfare, of which reducing injurious pecking is an important factor. The veterinary profession works closely with the poultry industry on red mite control, and the prevention of bacterial diseases including *E. coli*, *Erysipelas* and *Pasteurella*, through vaccination strategies and other measures, against a background of antibiotic reduction.

### Other approaches

The industry is working in partnership with academics to develop and test the effectiveness of hard, abrasive materials presented as pecking blocks. For example, one company has taken up the licence to manufacture and sell a material developed by a university. This company has sponsored an MSc to test the effectiveness of the block in maintaining or reducing beak sharpness at rear in 16 flocks of commercial birds, half of which had intact beaks. Further, they have provided pecking blocks for another PhD project investigating their use both on range and in-house as part of an enrichment package.

*Recommendation 8 – The Government should support research which is needed to establish sensitive and cost-effective methods for the earliest possible detection of injurious pecking, and to develop evidence-based protocols to respond promptly with the aim of avoiding the escalation and spread of this behaviour.*

The work of the LHWF would not be possible without the EIP grant funding. This work will enable the industry, with the support of like-minded NGOs, veterinarians, government and others, to drive forward strategies and actions to further reduce injurious pecking.

## Conclusion

We believe that now EIP grant funding has been made available, we will be able to drive forward the strategies and actions needed. In our next update to ministers we hope to be able to demonstrate tangible reductions in injurious feather pecking.

Yours sincerely,

Andrew Joret

A handwritten signature in black ink that reads "Andrew Joret". The signature is written in a cursive, slightly slanted style.

Chairman, LHWF

**Members of the Laying Hen Welfare Forum Management Group**

Andrew Joret (Chairman)	BEIC
Mark Williams	BEIC
Richard Kempsey	Stonegate Farmers
Claire Weeks	University of Bristol
David Brass	The Lakes Free Range Egg Company
Gary Ford	NFU
Robert Gooch	BFREPA
Mia Fernyhough	RSPCA
Stephen Lister	Crowshall Veterinary Services
Defra representative	
APHA representative	

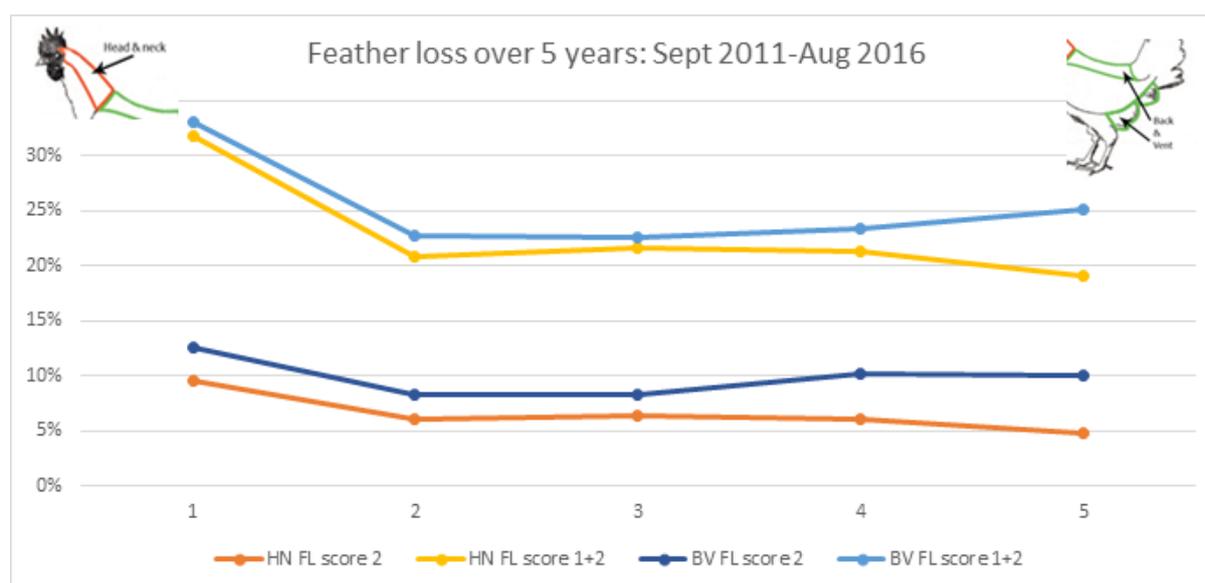
**Terms of Reference of LHWF**

1. Establish economically positive ways of continuing improvement in animal welfare for laying hens and pullets
2. Prioritise animal welfare issues affecting laying hens and pullets
3. Prioritise R&D needs for pullets and laying hens
4. Establish, monitor and report annually on animal welfare indicators
5. Promote knowledge transfer to the wider egg industry, including the domestic poultry keeping sector, and endeavour to encourage adoption of best practice by all
6. Advise on training requirements for the industry
7. Act as a liaison body for pullets and laying hens with the proposed Centre for Innovation Excellence in Livestock
8. Liaise with the Poultry Health & Welfare Group
9. Seek to establish links with any comparable bodies in the EU or third countries
10. Create a LHWF website to help promote the aims of the LHWF, to assist in knowledge transfer and use the website as a vehicle for reporting animal welfare indicators
11. All parties on the steering group to agree the content of any communications from the LHWF
12. Support Defra and the devolved administrations in dealing with notifiable diseases
13. Create specialist sub-groups for specific welfare topics, set their terms of reference and propose their membership
14. Make recommendations for animal welfare improvements for laying hen and pullets to appropriate bodies

## AssureWel Data

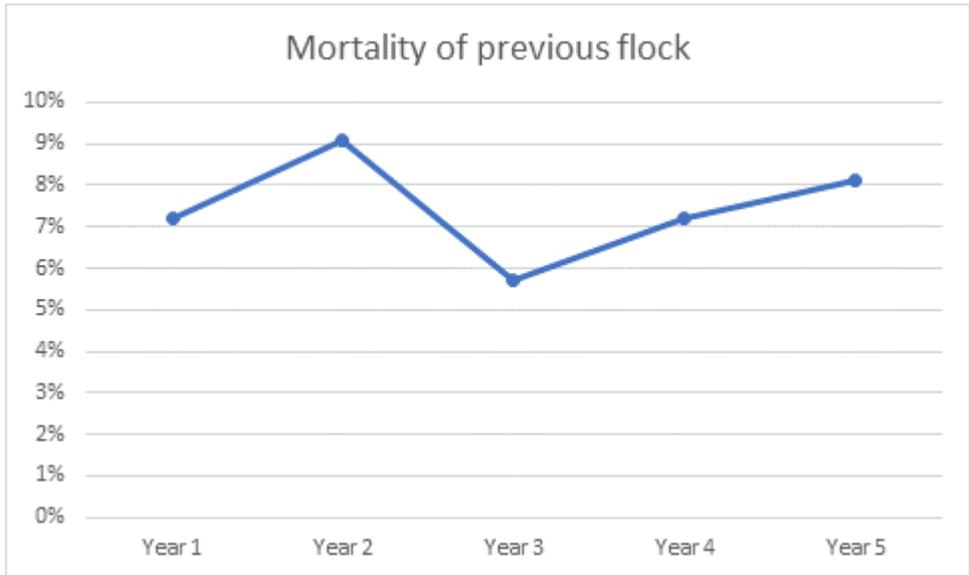
AssureWel, a project led by the University of Bristol, RSPCA and Soil Association supported by the Tubney Charitable Trust, has developed a system of welfare outcome assessments for the main terrestrial farm animal species, so that welfare can be measured and the impact of management interventions evaluated. For laying hens, these assessments have been available for farm assurance schemes and individual producers to monitor feather cover - along with six other measures - in non-cage systems since 2011. These assessments are now embedded into both the Soil Association and RSPCA Assured certification assessments and provide a robust and accurate assessment of levels of feather cover in the UK cage-free flock.

Data from Years 1 - 2 was presented in the BTAG Review (November 2015) demonstrating a significant improvement in feather cover in the assessed farms across the two schemes between September 2011 and August 2012. Descriptive data on feather cover and mortality is now available for years 1-5 (2011 - 2016) and is presented below. A full analysis of data including assessments from 2017 will be available in early 2018.



Back and vent feather loss (BV FL) is a proxy measure of injurious pecking (IP) in a flock. Score 1 represents slight feather loss (from 1-2 adjacent feathers missing up to a maximum 5cm bare skin visible), whilst score 2 represents moderate to severe feather loss (>5cm bare skin visible). The total percentage of birds with back and vent feather loss (BV FL score 1+2) has increased slightly from years 3-5. The percentage of birds with moderate and severe BV FL also demonstrates a slight upward trend. Statistical analysis will be available in 2018.

Head and neck feather loss (HN FL) provides an indication of aggressive pecking in a flock and may also occur due to mechanical damage. There is a general downward trend for both total HN FL (score 1+2) and moderate / severe HN FL (score 2), although it is not known whether this trend is significant.



Data collected on the mortality of the previous flock at the time of assessment provides end of lay mortality data, although it relates to the previous flock and is not linked to the percentage feather loss for the same year.

Data collection continues as an integral part of each scheme. These data enable producers to compare their results with other producers and benchmark their own performance with previous flocks, to identify targets for improvements, particularly on feather loss and mortality. The data additionally provides a robust and accurate assessment of feather loss at scheme level, covering the vast majority of non-cage production in the UK, and therefore allowing the monitoring of non-cage industry prevalence. Statistical analysis will provide an indication of risk factors associated with feather loss, providing scientifically informed interventions for use at farm, scheme or national levels.