

SHORT TERM SCIENTIFIC MISSION (STSM) – SCIENTIFIC REPORT

The STSM applicant submits this report for approval to the STSM coordinator

Action number: CA15134

STSM title: The Ethical Considerations of Laying Hen Genetics Companies

STSM start and end date: 05/02/2018 to 16/02/2018

Grantee name: Mia Fernyhough

1. Aims and objectives of the STSM

Despite societal concerns about the welfare of commercial laying hens, very little attention has been paid to the welfare implications of the work done by genetics companies involved with breeding of laying hens when compared with other livestock species. The choices made by these companies regarding trait selection and other aspects of breeding significantly affects living conditions for the world's commercial laying hens. It was considered that a review or analysis of the impacts and responsibilities of genetics companies was missing from the dialogue relating to laying hen welfare. The purpose of the STSM, and of visiting the Social Sciences Department at the University of Stavanger, was therefore to enable an exploration of the ethical responsibilities of breeding companies and their considerations and constraints in relation to improving laying hen genetics, particularly in relation to injurious pecking and other welfare issues associated with group house situations. The STSM brought together the disciplines of ethics, genetics and animal welfare, with the aim of producing a scientific paper for publication in a suitable, peer-reviewed journal considering how breeding companies relate to ethical issues, and how they should relate to them, given expectations of decent laying hen welfare.

Specifically, the STSM contributes to one of the core aims of the Action, namely to facilitate knowledge exchange (publication of a scientific paper), thus raising awareness of the potential impact of ethically motivated genetic improvements in areas of significant welfare concern.

On a personal note, working in an applied area of laying hen welfare, the knowledge gained during the STSM has helped me in my day to day work in the areas of policy, standards development and lobbying of both government and industry. In particular, the knowledge I have gained in relation to biosemiotic ethics helps to articulate the necessity to protect the welfare of animals where there is scant evidence of their sentience, as sentience is often a pre-requisite for consideration of animal welfare.

2. Description of work undertaken

Prior to the commencement of the STSM, and in preparation for it, I spent two days with a genetics company, Hendrix Genetics, meeting with their geneticists, their Research and Development Director and Global Director of Quality Management in Layers. I was given a full tour of the hatchery. They shared with me their own thoughts on the ethical considerations they have to make as a business, the different stakeholders they must engage with and their responsibilities in terms of global compliance and leadership. Hendrix provided insight into their operations, the dilemmas they face in terms of meeting the expectations of the wide ranging stakeholders who have interest in the business and the developments in the business over the years, including the various mergers and the technical innovations they have adopted. Standard operating procedures and their welfare policies were shared on a confidential basis. This provided an excellent grounding for the work that would take place during the STSM.

During the STSM: As a theoretical, ideas based STSM project, the work involved plenty of discussion and sharing of ideas regarding the ethical perspectives through which we could analyse some of the animal welfare and broader ethical issues under consideration. Working together with Associate Professor Tønnessen afforded me knowledge and insight into a number of ethical frameworks to which I was not previously aware and which had useful application in welfare science, and of course in the consideration of the actions of genetics companies. We discussed ethical concepts well known within the welfare arena, such as Utilitarianism and the Capabilities Approach, but also some less well known, in particular biosemiotics which places sentience within a broader ecological context. A better understanding of these ethical concepts aided a more objective analysis of the welfare issues with which we were concerned. With a wide array of ethical dilemmas facing genetics companies some time was spent considering which issues were deserving of ethical scrutiny; ranging from animal welfare concerns, to environmental and economical constraints and the interplay between them.

As the planned output of the STSM was an academic publication, the development of a disposition and consideration of the most appropriate journals to submit to was a key outcome. In order to meet the aims of the STSM to facilitate knowledge exchange and raise awareness of the potential impact of ethically motivated genetic improvements, it was important that we targeted a suitable publication. We felt that the welfare community, rather than the ethics community was the right audience for this work and on that basis we set about researching appropriate, well ranking welfare journals with an interest in ethical review papers. We hope to publish our finalised paper in *Animal Welfare* or, as a second choice, *Journal of Agricultural and Environmental Ethics*.

During the two week STSM period the following disposition had been developed for further consideration by the paper's co-authors, including Christine Nicol (Royal Veterinary college), Michael Toscano (university of Bern), James Yeates (RSPCA) and possibly geneticist Teun van de Braak (Hendrix Genetics):

DETAILED DISPOSITION

1. Abstract

2. Introduction

2.1 Market structure and chain of production in the layer industry

- 2.1.1 Emergence of global market dominance by 2 genetics companies
- 2.1.2 Chain of production: Genetics – farm – consumer
- 2.1.3 Tailoring breeds to different markets and societal expectations

2.2 Industry dilemmas in breeding of layers

- 2.2.1 Commercial interests vs. societal concerns (cf. trait selection)
- 2.2.2 Animal welfare concerns vs. other societal concerns
- 2.2.3 Example: Animal welfare vs. environmental sustainability

2.3 Animal welfare dilemmas in breeding of layers

- 2.3.1 Conflicting animal welfare concerns
- 2.3.2 Examples: individually housed pure line layers (line vs. offspring welfare); length vs. quality of life; health vs. behavioural freedom

3. Discussion

3.1 Our basic ethical perspective

- 3.1.1 Biosemiotic particularism + sentience-based approach + good life-framework (?)
- 3.1.2 Acknowledging moral concerns regarding both individual welfare and ecosystem functioning

3.2 Distribution of moral responsibility across different levels of the layer industry

3.2.1 How far does the moral responsibility of genetics companies extend? (cf. genetic vs environmental impact)

3.2.2 Direct vs. indirect responsibility (direct for birds in their care; indirect for offspring)

3.2.3 Summing up: The genetics companies' responsibility; the farm's responsibility; the consumer's responsibility

3.3 Specific issues

3.3.1 Feed withdrawal as a way to induce moulting (& longevity/extended laying cycles)

3.3.2 Intact beaks (& lighting conditions / breeding for altered beaks)

3.3.3 Reducing injurious pecking by breeding docile layers (= less good lives?)

3.4 Resolving dilemmas

3.4.1 Thinking in terms of combining different concerns: What concerns can be addressed in concert?

3.4.3 Thinking in terms of ideal conditions

3.4.2 Thinking in terms of minimum standards for what is morally permissible

4. Conclusion

5. Animal welfare implications

6. Acknowledgements

7. References

An early draft was completed by the end of the two week STSM visit.

3. Main results

We have considered the dilemmas facing genetics companies, their responsibilities, and actions in relation to welfare and other societal concerns, including environmental sustainability and their role within agriculture. We have drawn some conclusions and recommendations relating to actions that could be taken in the immediate or longer term to help improve animal welfare in relation to the following:

- Genetic selection parameters
- The use of emerging technologies, including GM
- Housing and management of breeding birds
- Transparency of operations and market positioning
- Reporting

Within our draft paper, a recurring theme is that, 'every magic comes at a price'. In the global egg production system, there is a clear tendency to the effect that making progress with regard to one welfare concern, typically involves greater or changed challenges with regard to interrelated welfare concerns. This is clearly seen in the development of higher welfare loose housed systems, whereby the additional freedom granted, may result in an exacerbation of certain welfare concerns, such as injurious pecking. Often the industry looks to genetics companies to solve these issues however this is rarely an easy or straight-forward solution. Genetic improvements take time (currently 4 years to see an improvement 'on the ground') and may have undesirable or unexpected consequences. Breeding for docility in hens may solve the issue of injurious pecking, but we may diminish the hens' ability to experience pleasure. Dependent upon one's ethical position (including mine), this could be considered unacceptable.

We also consider that 'new' genetics may require development in management techniques, nutrition or housing and, in the past these developments may not have moved in tandem. Both keel bone fracture and injurious pecking have multi-factorial aetiologies, perhaps, for example, because genetic and nutritional strategies have not kept up with developments in housing design. One of our conclusions is therefore a need for hand-in-hand development in relation to new systems, genetics, nutrition and management if welfare is to be optimised.

We consider improved transparency as an important vehicle for welfare improvements. A level of transparency with regard to welfare traits (bone health, cannibalism, morbidity) concomitant with the *current* level of transparency with regard to productivity traits should not only be desirable, but also possible - after all, each of the major genetics companies is selecting on these traits and therefore must also be measuring them. Such data may be influenced by environment factors, but the same can equally be said for each productivity measure. We therefore encourage greater transparency in this area, which will also aid the development of a more 'hand-in-hand' approach as described above.

The more transparent genetics companies are about the genetic profiles of their breeds, the easier it is to apportion responsibility to the various actors within the supply chain (which could work in the genetics companies' favour). Moreover, producers (and retailers and farm assurance schemes) can begin to objectively select (or require) the use of breeds based on welfare performance. In turn, these welfare measures become important points of difference, which could help to drive genetic improvements in welfare similar to those seen in egg productivity. Critically, this can only be successful if there is customer, consumer and / or legislative demand for higher welfare traits.

Going beyond self reporting of welfare measures by genetics companies, we also recommend the formation of an independent body to test and report on the welfare outcomes of new and existing breeds - on a rolling basis to take into account genetic developments. This would provide a reliable reference point both for industry, farm assurance bodies and consumers and ensure consistent measurement across the different breeds.

In consideration of the ideal situation we consider that the development of a 'higher welfare breed' should and could be pursued. Given sufficient consumer demand and willingness to pay, the development of layer breeds aimed at maximizing animal welfare does not necessarily have to involve breeding goals aimed at improved feed efficiency or extended layer cycles. Such breeding goals should only be included for high welfare-breeds to the extent that they are beneficial for, or consistent with, animal welfare. This would involve a prioritisation of animal welfare concerns over sustainability concerns and productivity concerns. From a commercial perspective, such prioritisation could be justified by the marked profitability of such breeds, assuming sufficient ethical consumer awareness. From the perspective of environmental sustainability, the prioritisation of animal welfare may not be optimal, but this can be balanced by reduced egg consumption replaced by a more plant-based diet.

Outside of genetics companies' impacts on the welfare of birds on farm via their selection programmes, we also consider the welfare impacts they have on the breeding flocks under their direct care. We give thought to some of the selection methods currently used (group selection, genomic selection, challenge tests) and whether others, particularly GM techniques, may be considered acceptable in the future.

Lastly we consider some of the wider ethical issues, including environmental sustainability and human nutrition, which sometimes conflict with animal welfare goals. We critically review some of the claims

made by genetics companies regarding improvements in environmental efficiencies and the impacts they have – ultimately as egg producers – on global nutrition goals.

4. Future collaboration possibilities with the host institution

We continue to collaborate on the further development and refinement of our paper, but have no future plans for follow-up projects beyond this.

5. Future plans, including potential future publications

We plan to submit a paper for publication in summer 2018. The proposed title for the paper is as follows:

Mia Fernyhough¹, Christine J. Nicol², James Yeates³, Michael J. Toscano⁴, Morten Tønnessen⁵, forthcoming. The ethics of laying hen genetics. To be submitted to *Animal Welfare* (secondarily *Journal of Agricultural and Environmental Ethics*).

6. Outputs produced

A draft paper has been developed.