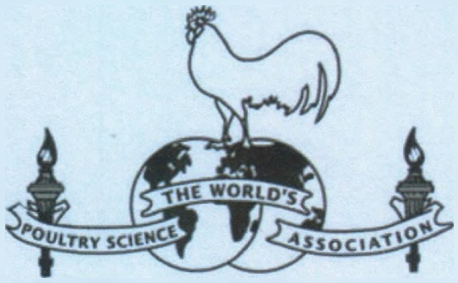

education organization research

World's Poultry Science Association (UK Branch)

Annual Meeting

10-11 April 2018

Programme and Summaries

Nally Suite

Hogan level 4

Croke Park Stadium, Dublin

Including BSAS programme

education organization research

WPSA (UK Branch) ANNUAL MEETING

10-11 April 2018
Croke ParkStadium, Dublin

Monday 9th April 2018 Nally Suite

08:00 –18:00 Registration

16:10-18:05 WPSA/BSAS Rapeseed meal satellite session (See BSAS Programme)

Tuesday 10th April 2018 Hogan Suite

9:00-10:00 Hammond lecture (BSAS – WPSA delegates welcome to attend)

Tuesday 10th April 2018 Nally Suite

10:30 OPENING WPSA ANNUAL MEETING

10:40-11:50 Session 1: Invited Speaker session: Advances in management of laying hens
Chair: Vicky Sandilands

10:40 1 Teun van de Braak (Hendrix)
Breeding for prolonged laying cycles in laying hens, a breeding program explained

11:10 2 Jason Gittens (ADAS)
The Impacts of UK buyers' intentions to purchase only non-cage eggs from 2025

11.50-12.20 Session 2: Original Communications (Nutrition) (14 min)
Chair: Helen Masey O Neill

11.50 3 Growth and egg laying performance of Japanese quails fed diets containing varying levels of sorghum and maize.
A.T. Ijaiya, S. S. A Egena, O. Omamugho, S. Adio

12.04 4 Evaluation of oats with varying husk inclusion on performance, energy and nitrogen retention in broilers
D.V. Scholey, A. Marshall, S. Cowan, E.J. Burton

12:30-13:30 Lunch, Croke Park. room TBC

13:30-14:54 Session 3: Original communications (Physiology and husbandry in broilers and layers) (14 mins)
Chair: Patrick Garland

13:30 5 Egg quality is improved when a 300ppm calcium pidolate supplement is added to the layer diet from 50-70wks
M.M. Bain, T. Parkin, R. Gill, D Brass, B Pollet

13:44 6 Favourable genetic parameters for the improvement of cuticle deposition on eggs
I.C. Dunn, P.W. Wilson, M.M. Bain, A. Jones, F. Quinlan-Pluck, G.O.S. Williams, W. Icken, V. Olori

13:58 7 The effect of ranking laying hens by feed efficiency on the quality and nutrient composition of eggs
Y. Akter S. Greenhalgh, M.D. Islam, D Anene, C.J. O'Shea

14:12 8 Quantitative assessment for the risk of recrudescence of avian influenza in caged layer houses following depopulation: The effect of cleansing, disinfection and dismantling of complex equipment
P Gale, S Sechi, V Horigan, L Kelly

14:26 9 Growth performance and behaviour of broiler chicken reared under two different light bulb sources and distances
O.O. Adeleye, L.T Egbeyale, O Ayo-Ajasa, M.O. Abatan, A.W. Abdkareem, A.O. Odukoya, O.E. Akinsola

14:40 10 Superoxide dismutase activity in the chicken gut
P.F. Surai, I.I. Kochish, S.O. Shapovalov

14:54 – 15:12 Short oral introductions to a selection of poster presentations (3 min)
Chair: Nick Sparks

14:54 11 Investigation into the effect of semi-synthetic diets on the intestinal mucin layer of broilers
S. Amir, D.V. Scholey, M. Le Bon, E.J. Burton, C. Turkura

14:57 12 Dietary prebiotic, probiotic and synbiotic supplementation on the immune function of meat chickens
A. Alsudani, S. Ali, M. Le Bon, D.V. Scholey, G. Manning, E.J. Burton

15:00 13 Influence of naked neck gene and housing system on egg production and immune response of laying hens
M. Fathi, I. Al-Homidan, T. Ebeid, O. Abou-Emera

15:03 14 Supporting gut health of high performing broilers in the presence of coccidiosis
D. Harrington, H. Hall, C. Mathis, W. Wakeman,

15:06 15 *Curuma longa* supplementation of broiler feed: Effect on Physiological Responses and Performance under Hot Humid Tropical Climate
O. Oke, J. Daramola, A. Rahman, T. Lawal

15:09 16 The effect of Calcareous Marine Algae in diets containing low levels of calcium on broiler performance, bone strength and meat quality parameters
M.E.E. Ball, D. Farrell, S.Taylor

15:12-16:00 Tea and poster viewing, Authors in attendance

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Superoxide dismutase activity in the chicken gut

P F Surai[1,2], I I Kochish[2], S O Shapovalov[4]
[1]*Trakia University, Stara Zagora 6000, Bulgaria,* [2]*Moscow State Academy of Veterinary Medicine and Biotechnology named after K.I. Skryabin, Moscow, 109472, Russia,* [3]*Szent Istvan University, Gödöllo H-2103, Hungary,* [4]*Research-Testing Center Cherkizovo, v. Yakovievskoye, Moscow, 143340, Russia*
psurai@feedfood.co.uk

APPLICATION

Superoxide dismutase is key antioxidant enzyme in the chicken intestine preventing oxidative damage in stress conditions and participating in adaptation to various stress conditions. Interestingly, it can be regulated by various nutrients.

INTRODUCTION

Poultry production is associated with a range of stresses including environmental (high or low temperature, dust), technological (chicken placement, grading, weighing), nutritional (mycotoxins and oxidized fat) and internal/biological (fast growth, microbial or viral challenge) stresses. It was proven that at the molecular level most of stresses are associated with overproduction of free radicals and oxidative stress. Therefore, during evolution antioxidant systems have been developed in animal body to prevent possible detrimental consequences of oxidative stress. The antioxidant defence network in the tissues is very complex and includes natural antioxidants (e.g. vitamins E and C, glutathione, thioredoxin, antioxidant enzymes), transcription factors (Nrf2 and NF-κB) and vitagenes. This network is responsible for adaptation to stress by upregulating various genes and increasing synthesis of protective molecules, including heat shock proteins (to maintain protein integrity), antioxidant enzymes, including superoxide dismutase (SOD), glutathione peroxidase and other selenoproteins (thioredoxin reductase, methionine sulfoxide reductase) and catalase (Surai, 2016). Antioxidant-prooxidant balance in the chicken gut is of great importance for maintenance of a healthy gut and deserve more attention. Superoxide dismutase was characterised in different chicken tissues (Surai, 2016) and included into the vitagene family (Surai and Fisinin, 2016). However, there is no data available on SOD activity in the gut of adult birds. Therefore the aim of this study was to evaluate total SOD activity in different segments of the chicken gut.

MATERIALS AND METHODS

An experiment was conducted with Lohman Brown layers at age of 34 weeks (peak of egg production) which were fed on a commercial wheat-barley diet balanced in all nutrients in accordance with Lohman recommendations. All other technological parameters were also within the recommended levels. Ten layers with an average for the age body mass and productivity were sacrificed in accordance with the Guide for the Care and Use of Laboratory Animals of the National Institutes of Health and the intestinal tract was collected and divided into duodenum, jejunum, ileum, ceca and colon. Total SOD activity and lipid peroxidation (as malondialdehyde) in mucosa of each gut segment were determined spectrophotometrically using kit systems supplied by Randox Ltd. (Crumlin, UK) and Sigma-Aldrich (USA), respectively. Statistical analysis was performed by 1-way ANOVA and *t* test.

RESULTS

There is a significant difference in total SOD activity between different segments of the gut. Based on the SOD activity the laying hen intestinal segments can be placed in the following descending order: duodenum>jejunum=ileum>>ceca>colon. From one hand, the total SOD activity in the duodenum was significantly (by 40%, $P<0.05$) higher than that in jejunum or ileum. On the other hand, the total SOD activity in the ceca was shown to be significantly (by 32%, $P<0.05$) lower than that in jejunum or ileum, but substantially higher (by 24%, $P<0.05$) in comparison to that in the colon. Interestingly, lipid peroxidation (MDA) was found to be highest in jejunum and the order of the intestinal segments in accordance with MDA level (jejunum>duodenum>ileum>ceca=colon) is not the same as for SOD, reflecting importance of other protective mechanisms in the intestine (beyond SOD) responsible for antioxidant defences. Indeed there is a need for more detailed evaluation of the antioxidant system of the chicken gut depending on age, nutrition and stress. It would be also very important to study a relationship between antioxidant defences and microbiota in the chicken gut to understand molecular mechanisms of the maintenance of healthy gut in stress conditions.

CONCLUSION

There are site-specific antioxidant defence mechanisms in the chicken gut and the highest SOD activity was found in the duodenum while the lowest level of lipid peroxidation was shown in the ceca and colon.

ACKNOWLEDGEMENTS

This work is supported by a grant of the Government of Russian Federation (Contract No. 14.W03.31.0013).

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Surai, P.F. (2016). *Journal of Animal Research and Nutrition* 1, 1, 8.
Surai, P.F., and Fisinin, V.I. (2016). *World's Poultry Science Journal* 72, 793-804.
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