

Table of Contents

In Press

Article Archive

CJAS (63) 2018

CJAS (62) 2017

CJAS (61) 2016

CJAS (60) 2015

CJAS (59) 2014

Issue No. 1 (1-44)

Issue No. 2 (45-95)

Issue No. 3 (97-145)

Issue No. 4 (147-199)

Issue No. 5 (201-249)

Issue No. 6 (251-295)

Issue No. 7 (297-343)

Issue No. 8 (345-390)

Issue No. 9 (391-443)

Issue No. 10 (445-493)

Issue No. 11 (495-537)

Issue No. 12 (539-578)

CJAS (58) 2013

CJAS (57) 2012

CJAS (56) 2011

CJAS (55) 2010

CJAS (54) 2009

CJAS (53) 2008

CJAS (52) 2007

CJAS (51) 2006

CJAS (50) 2005

CJAS (49) 2004

Editorial Board

Ethical Standards

Reviewers 2017

For Authors

Author Declaration

Copyright Statement

Instruction for Authors

Submission Templates

Fees

New Submissions/Login

Subscription

Bones quality indices in laying hens fed diets with a high level of DDGS and supplemented with selected feed additives

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An experiment with 192 caged ISA Brown laying hens, fed a diet containing a high level of corn distillers dried grains with solubles (DDGS), was conducted to determine the influence of selected feed additives on biomechanical and geometrical indices of tibia and femur bones. At 26 weeks of age hens were randomly assigned to 8 treatments with 12 replicates (cages of two hens). To week 55, hens were fed isocaloric and isonitrogenous experimental diets either containing or not containing a high level of DDGS (200 g/kg). The diet containing 200 g/kg of DDGS was supplemented or not supplemented with feed additives, i.e. enzymes (xylanase and phytase), sodium butyrate, probiotic bacteria (*L. salivarius*), herbal extract mixtures (*Taraxaci siccum*, *Urticae siccum*, and *Salviae siccum*), inulin or chitosan. At week 55, inclusion of DDGS in the diet had no effect on biomechanical (bone breaking strength, yielding load, and stiffness) or geometrical (cortex thickness, cross-section area, weight, and length) indices of tibia and femur bones ($P > 0.05$). Some of the supplements used had a beneficial effect on bone quality in hens fed the diet with a high level of DDGS. Thus, the addition of probiotic bacteria or herb extracts increased the breaking strength of femurs and breaking strength and yielding load of tibias ($P < 0.05$). The results of this study indicate that DDGS may be included to a level of 20% in the diet of laying hens without any negative influence on bone quality, while such feed additives as probiotic bacteria and herbal extracts may improve the selected biomechanical indices of bone quality of layers fed diets with a high level of DDGS.

Keywords:

layers; distillers dried gains with solubles; feed supplements; femur and tibia measurements

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