

Accepted Manuscript

The effect of insulin on plasma glucose concentrations, expression of hepatic glucose transporters and key gluconeogenic enzymes during the perinatal period in broiler chickens

Lies Franssens, Jens Lesuisse, Yufeng Wang, Els Willems, Hilke Willemsen, Astrid Koppenol, Xiaoquan Guo, Johan Buyse, Eddy Decuypere, Nadia Everaert

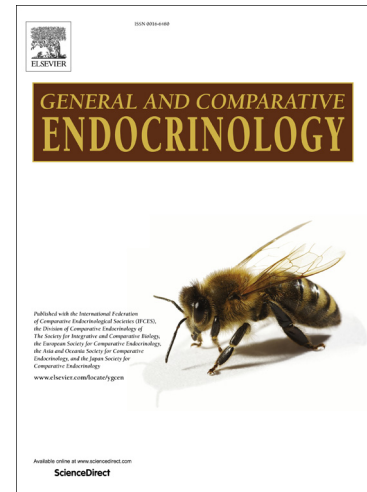
PII: S0016-6480(15)30061-7
DOI: <http://dx.doi.org/10.1016/j.ygcen.2015.12.026>
Reference: YGCEN 12277

To appear in: *General and Comparative Endocrinology*

Received Date: 21 May 2014
Revised Date: 18 December 2015
Accepted Date: 22 December 2015

Please cite this article as: Franssens, L., Lesuisse, J., Wang, Y., Willems, E., Willemsen, H., Koppenol, A., Guo, X., Buyse, J., Decuypere, E., Everaert, N., The effect of insulin on plasma glucose concentrations, expression of hepatic glucose transporters and key gluconeogenic enzymes during the perinatal period in broiler chickens, *General and Comparative Endocrinology* (2015), doi: <http://dx.doi.org/10.1016/j.ygcen.2015.12.026>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



The effect of insulin on plasma glucose concentrations, expression of hepatic glucose transporters and key gluconeogenic enzymes during the perinatal period in broiler chickens

Lies Franssens,^a Jens Lesuisse,^a Yufeng Wang,^a Els Willems,^a Hilke Willemsen,^a Astrid Koppenol,^{a,b} Xiaoquan Guo,^c Johan Buyse,^a Eddy Decuypere,^a and Nadia Everaert^{a,d}

^aKU Leuven, Department of Biosystems, Laboratory of Livestock Physiology, Kasteelpark Arenberg 30 Box 2456, 3001 Leuven, Belgium

^bILVO Animal Sciences Unit, Scheldeweg 68, 9090 Melle, Belgium

^cCollege of Animal Science and Technology, Jiangxi Agricultural University, 330045 Jiangxi, China

^dUniversity of Liège, Gembloux Agro-Bio Tech, Animal Science Unit, Passage des Déportés 2, 5030 Gembloux, Belgium

Corresponding author: Johan Buyse, KU Leuven, Department of Biosystems, Division of Animal & Human Health Engineering, Laboratory of Livestock Physiology, Kasteelpark Arenberg 30, Box 2456, 3001 Leuven, Belgium

Phone number: +32 16 328525

E-mail address: johan.buyse@biw.kuleuven.be

Abstract

Chickens have blood glucose concentrations that are two-fold higher than those observed in mammals. Moreover, the insulin sensitivity seems to decrease with postnatal age in both broiler and layer chickens. However, little is known about the response of insulin on plasma glucose concentrations and mRNA abundance of hepatic glucose transporters 1, 2, 3, 8, 9 and 12 (GLUT 1, 2, 3, 8, 9 and 12) and three regulatory enzymes of the gluconeogenesis, phosphoenolpyruvate carboxykinase 1 and 2 (PCK 1 and 2) or fructose-1,6-biphosphatase 1 (FBP1) in chicks during the perinatal period. In the present study, broiler embryos on embryonic day (ED)16, ED18 or newly-hatched broiler chicks were injected intravenously with bovine insulin (1µg/g body weight (BW)) to examine plasma glucose response and changes in hepatic mRNA abundance of GLUTs, PCK1 and 2 and FBP1. Results were compared with a non-treated control group and a saline-injected sham group. Plasma glucose levels of insulin-treated ED18 embryos recovered faster from their minimum level than those of insulin-treated ED16 embryos or newly-hatched chicks. In addition, at the minimum plasma glucose level seven hours post-injection (PI), hepatic GLUT2, FBP1 and PCK2

Download English Version:

<https://daneshyari.com/en/article/5900804>

Download Persian Version:

<https://daneshyari.com/article/5900804>

[Daneshyari.com](https://daneshyari.com)