



HAL
open science

Altered bone health in laying hens is associated with FGF23 overexpression in the medullary bone

Michel Duclos, Audrey Gloux, Agnès Narcy, Joël Gautron

► To cite this version:

Michel Duclos, Audrey Gloux, Agnès Narcy, Joël Gautron. Altered bone health in laying hens is associated with FGF23 overexpression in the medullary bone. 17. International Symposium on Biomineralization (BIOMIN XVII), Université Jean Monnet, Aug 2023, Saint - Etienne, France. hal-04213904

HAL Id: hal-04213904

<https://hal.science/hal-04213904>

Submitted on 25 Sep 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Public Domain

17th International Symposium
on Biomineralization

BIOMIN XVII

Saint-Étienne, France



UNIVERSITÉ
JEAN MONNET
SAINT-ÉTIENNE



FACULTÉ
DE MÉDECINE

INRAE

SÉM

SAINT-ÉTIENNE
la métropole

BOOK OF ABSTRACTS

2023

From August 28th
to September 1st



Venue

Faculty of medicine
Jean Monnet University
Saint Etienne, France

Date

28th August
1st September
2023



Université
Jean Monnet
Saint-Étienne



Faculté
de Médecine
Jacques Lisfranc • Saint-Étienne

T3 O3

Altered bone health in laying hens is associated with FGF23 overexpression in the medullary bone

Michel Duclos, Audrey Gloux, Agnès Narcy, Joël Gautron

INRAE, Université de Tours, BOA, 37380 Nouzilly, France.

michel.duclos@inrae.fr

For the production of each egg, the hen must allocate about 2 g of Ca for eggshell formation, which originates from its diet and from bone mobilisation. As the hen lays between 300 and 500 eggs during its carrier, the challenge to Ca homeostasis is high, and pathological signs such as osteoporosis, deviations or fractures of the wishbone, or even fractures of long bone, show an increasing prevalence at the end of the production cycle. In their less serious forms, they compromise animal welfare, but they can also lead to culling and losses, or to the early termination of a flock. This sets the need to better understand the physiological mechanisms of calcium homeostasis in hens, particularly those involving bone tissue. At sexual maturity the hen develops a specific type of medullary bone, which is subject to daily cycles of bone remodelling and thus serves as a temporary store of Ca. The team's recent work provides new data on the effectors of calcium transport through the intestinal epithelium, on the mechanisms of bone turnover and their regulation. It is consistent with previous ones in highlighting the central role of vitamin D and its metabolites. Moreover, it also highlights a factor that had not yet been studied in details in the laying hen, Fibroblast Growth Factor-23 (FGF23). It is expressed by the medullary bone when eggshell synthesis is active in the uterus and bone mobilisation is maximal. The expression of its putative receptors (FGFRs) and coreceptor (KL) in the kidney suggest that it could exert its action by promoting the urinary excretion of P resulting from osteolysis. In addition, by inhibiting the synthesis of the active form of vitamin D3 or by activating its degradation, it would exert a negative feedback on Ca and P retention. FGF23 is overexpressed during in the late laying hen compared to the peak laying hen. This opens up the possibility of research into whether FGF23 is the cause or only a marker of deregulation of phosphocalcic metabolism