Regulation of Bone Formation and Resorption:

• Systemic hormones
• Local factors (Prostaglandins, Nitric Oxide, Cytokines)

METABOLIC BONE DISEASE IN ZOO’S COLUMBIFORMS:
BIBLIOGRAPHIC REVIEW AND CASE REPORT

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1. INTRODUCTION

• This work is based on the research of the cause of Metabolic Bone Disease affecting the species Otidiphaps nobilis aruensis at Barcelona Zoo.
• For fulfilling this objective a basic literature review of bones and its physiology has been made, as well as a list of factors that may affect ossification, emphasizing the deficiency of Vitamin D and calcium.

2. GENERAL CONSIDERATIONS ABOUT BONES

• Figure 1. Cellular Elements of Bone Tissue
• Figure 2. Bone Matrix

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3. ACQUIRED ABNORMALITIES IN SKELETAL GROWTH, DEVELOPMENT, AND REMODELING

• Malnutrition and Starvation
• Overnutrition
• Mineral Imbalances
• Vitamin Imbalances
• Reduced exposure of UVB radiation
• Nutritional Problems
• Etc.

Vitamin D and Calcium Deficiency

4. METABOLIC BONE DISEASE

OSTEOPOROSIS
RICKETS AND OSTEOMALACIA
FIBROUS OSTEODYSTROPHY

5. CASE PRESENTATION

• Since 1992, 65 chicks have hatched at Barcelona Zoo (Sierra, 2012). At the time of writing Sierra’s (2012) article, Barcelona Zoo maintained 17-6 birds.
• Initial problem: March of 2014
• Offspring of an unique couple (exact number undetermined).
• Histopathological study seems to point towards a metabolic process.
• Procedures are currently being conducted to perform 6 analytics

DIETARY CHANGES
Calcium and Vitamin D supplementation

MANAGEMENT CHANGES
Sunlight exposure

During these months all pigeons were born without any bone problems

The possibility of an inherited disorder affecting the metabolism of vitamin D is also considered

6. CONCLUSIONS

• The issue described in this case is a Metabolic Bone Disease. It has not been managed to classify which kind of MBD it is yet.
• Its most likely etiology is from a lack of calcium and vitamin D due to absence of scarcity of UV-B radiation.
• Solutions such as altering the diet or supply UV-B radiation either artificially or via actual daylight are to be considered, preferably the latter.