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TITLE

USE OF BONE BIOMARKERS OSTEOCALCIN AND C-TELOPEPTIDE TO DIAGNOSE METABOLIC BONE DISORDERS IN PIGS

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CONTENT

Introduction

Lameness in growing pigs can be a serious health issue. About 2.5% of the submissions for post-mortem examination (PME) to GD Animal Health (Deventer, Netherlands) are diagnosed with lameness due to non-infectious causes like osteochondrosis or metabolic bone disease (e.g. osteoporosis). For these cases, GD investigated the practicality of diagnostic serological tests for lameness using bone biomarkers osteocalcin (OC) and C-telopeptide (CTx). The level of circulating OC indicates the rate of bone formation and the level of CTx bone resorption.

Material and Method

The GD laboratory uses quantitative ELISA tests for OC and CTx (nmid-osteocalcin ELISA and CrossLaps-ELISA, Nordic Bioscience Diagnostics). To establish reference values, test results were used from 148 healthy growing pigs aged between 1 and 6 months and compared to 245 pigs with lameness. Crippled growing pigs submitted for PME were included in the study when a non-infectious cause was diagnosed and concurrent results of bone biomarkers tests were known. Data from 10 well documented cases of lameness were used to determine the relation between metabolic disorders and bone biomarkers.

Results

In healthy growing pigs the average OC level was 27 µg/L and CTx level 0.30 µg/L. In pigs with clinical signs of lameness average bone biomarker levels were slightly decreased. In lame pigs with histologically confirmed osteochondrosis, OC and CTx levels did not differ significantly from healthy pigs. In crippled pigs with metabolic bone disease OC and / or CTx levels were significantly lower.

Discussion

We propose to use the OC/CTx ration as derived measurement for net bone formation and OC*CTx as measure for bone turnover. In pigs with metabolic bone disease bone turnover appears to be at a low level.

Conclusion

Bone biomarkers can be useful tools to establish whether metabolic bone disease is likely to be the cause of lameness in pigs.