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# Effect of physical activity of laying hens on bone condition

**Bone breakage is a serious welfare problem of laying hens in both intensive and extensive husbandry systems. Most commonly fractures are seen in hens selected for egg production and the fractures are attributed to osteoporosis**

## RESEARCH TARGET AND OBJECTIVES

The metabolic competition for calcium and phosphorus in eggshell and bone formation has been considered as important factor of osteoporosis and weak bones. In female birds coinciding with the maturation of ovarian follicles, a type of bone develops in the endosteal surface of long bones called "medullary bone" that is woven bone with a high rate of remodeling providing Ca for eggshell formation.

## MATERIALS AND METHODS

Three experimental diets with different fat sources were fed to 12 laying hens each: Palm oil (PO), Soybean oil (SO), and Linseed oil (LO). The fat sources corresponded to a low content of poly unsaturated fatty acids (PUFA) – PO, a high content of omega-6 (n-6) fatty acids – SO, and a high content of n-3 fatty acids (LO). Half of the hens of each dietary treatment (6 x 3 = 18 birds) were exposed to exercise by walking on a running treadmill (EG) through the four wks lasting experiment, whereas, the remaining 18 hens served as a control group (CG) and were permanently kept in the individual cages with very limited walking space.

Table1. Impact of feed and treatment in bone density

	TOT_A (mm <sup>2</sup> )			TOT_DEN (mg/ccm)			CRT_A (mm <sup>2</sup> )			CRT_DEN (mg/ccm)		
	Feed			Feed			Feed			Feed		
Treatment	L	P	S	L	P	S	L	P	S	L	P	S
N	53.3 a	47.5 bc	44.5 c	521.4	556.7	582.8	29.3 a	26.18 bc	24.52 c	835.8 b	873.0 ab	918.3 a
R	48.4 abc	44.3 c	52.7 ab	528.3	579.9	499.6	26.63 abc	24.41c	29.0 ab	845.3 a	912.6 a	804.7 b

## RESULTS

The application of training for the locomotion activity in laying hens has affected some bone characteristics. The same was for the dietary fat source. But, the overall effect of diets on bone characteristics was not significant. Nevertheless, there is a trend of higher level of total area and corticalis area in LO group as compared with PO and SO groups.