



EUROPEAN'S **CONFERENCE** POULTRY
JOURNAL

The Book of Abstracts



XVI European Poultry
Conference

VALENCIA

24th 28th June 2024

education
organization
research



ASOCIACIÓN
ESPAÑOLA DE
CIENCIA AVÍCOLA
(AECA - WPSA)

**XVI European Poultry Conference of the WPSA
Valencia - Spain
June 24 – 28, 2024**

Book of abstracts

**The European Federation of the WPSA
European's Poultry Conference Journal**

Editors

A.C. Barroeta, C. Garcés Narro, and G. Sayegh

Hosted by the:

**AECA - WPSA: Asociación Española de Ciencia Avícola
Spanish Branch of the World's Poultry Science Association**



Sea urchin waste as a sustainable source of calcium in laying hens production

F. Leone¹, M. Sugni¹, S. Marzorati¹, L. Ferrari¹, V. Ferrante¹

¹Università degli Studi di Milano - Dept. Environmental Science and Policy, Milano, Italy

Presenting author: francesca.leone@unimi.it

In Italy, about 2.000 tons of purple sea urchins (*Paracentrotus lividus*) are caught every year. Gonads are the only edible part, that represent a small percentage (10-30%) of the total mass of the sea urchin. Consequently, all the remaining constitutes a waste, which must be disposed off in landfills, an environmentally and economically unsustainable practice. It was demonstrated that the sea urchin test is mainly composed of calcium carbonate (calcite) rich in magnesium, but it also contains other antioxidant molecules, such as polyphenolic compounds. In this study sea urchin wastes were collected from restaurants and food industries, then they were dried and ground, and then included in laying hens feed, as a substitute for non-biogenic (rock-derived) calcium carbonate. The aim was to assess if this substitution could have effects on egg quality and animal welfare, considering that a calcium deficiency has critical impacts on egg production, shell quality, and welfare. One hundred twenty-eight hens were reared in enriched cages, divided into two groups (control and treatment), and their welfare was assessed based on their feather condition, in accordance with the Welfare Quality® protocol. At the end of the cycle, the bones breaking strength was measured. Moreover, every month, 48 eggs per treatment and their components were weighed, shell thickness and yolk colour were assessed, and the eggs breaking strength was measured. Shell weights did not differ significantly between the two groups, but the treated group showed significantly thicker shell, probably affecting the shell barrier function. Despite the increased thickness, no significant differences were found in the breaking strength. Concerning the welfare evaluation, the treated group showed fewer feather lesions in the back, tail, and crest area. Additionally, no significant differences were found between the two groups regarding tibia breaking strength. The absence of differences in egg quality and in the bones breaking strength, and the positive results obtained in the welfare evaluation confirm the feasibility of using sea urchin waste as a sustainable alternative to calcium carbonate.

Keywords: Sea urchin; waste; calcium: laying hens; production; welfare