yolk (YP), Haugh units (HU), yolk index (YI), shell percent (SP), shell thickness (ST) and egg specific gravity (ESG). The vitamin D influenced the parameters HU, YI, SP, ST, ESG when in thermoneutral temperature, the YI in a cyclic heat stress and ST, ESG in constant heat stress. The vitamin C interfered on HU, SP, ST, ESG under thermoneutral temperature and on YI under cyclic heat stress. Rectal and dorsal temperatures were not altered by different levels of vitamins D and C.

This experiment was conducted with laying hens from 20 to 70 weeks of age to evaluate the effects of vitamins D and C supplementation on performance, serum calcium and egg quality. One-hundred forty four singly caged leghorn hens Hy-Line W-36 were used in a completely randomized design with a factorial arrangement of 3x3: vitamin D (2500, 3000 and 3500 UI/kg) and vitamin C (0, 200 and 400 ppm), totaling 9 treatments with 4 replicates of 4 hens each. Three experimental phases (age of hens) were more expressive than the effects of vitamins D and C on the characteristics evaluated in these conditions.

The following abstract was inadvertently left out of the Nutrition Section

403 INFLUENCE of different levels of vitamins D and C and age of laying hens on performance and egg quality in the winter. Douglas Emigdio Faria, Mônica Roberta Mazalli, Daniely Salvador, Otto Mack Junqueira, and Pedro Alves Souza. 1Faculdade de Zootecnia e Engenharia de Alimentos, Pirassununga, SP/Brazil, 2Faculdade de Ciências Agrárias e Veterinárias, Jaboticabal, SP/Brazil.

An experiment with 8 weeks of duration was conducted in commercial conditions to evaluate the effects of age and vitamins D and C supplementation on performance and egg quality of laying hens in the winter. Six-hundred forty eight leghorn hens Hy-Line W-36 were used in a completely randomized design with a factorial arrangement of 3x3x3: vitamin D (2500, 3000 and 3500 UI/kg), vitamin C (0, 200 and 400 ppm) and age (33, 46 and 66 weeks), totaling 27 treatments with 4 replicates of 6 hens each. The characteristics measured were feed intake (FI), egg production (EP), egg weight (EW), egg mass (EM), percent of albumen (AP) and yolk (YP), Haugh units (HU), yolk index (YI), shell percent (SP), shell thickness (ST) and egg specific gravity (ESG). The results indicated interactions between vitamins D x C on egg production, age x vitamin C on yolk index and age x vitamin D on shell thickness. The vitamin D influenced on YP and the age on FI, EP, EM, FG, AP, YP, HU, SP and ESG. It was concluded that the main characteristics of performance, internal and external egg quality were not improved by utilization of different levels of vitamin D and C.

404 The role of monochromatic light in growth and development of broilers. I Rozenboim, I Biran, and O Halevy, The Hebrew University of Jerusalem, Faculty of Agriculture, Food and Environmental Quality Sciences, Department of Animal Sciences, Rehovot, Israel.

Artificial illumination and light quality are crucial in modern broiler management. In the present study a new highly efficient, light emitting diode based (LED), monochromatic light system has been developed for broilers and the effects of different wavelengths examined. In Exp. 1, 180 male broiler chicks (Anak) were divided into four light treatment groups (n=45) with 3 replicates. All birds were housed in a single room previously divided into 12 sealed cells of 1m2. Food and water were provided ad libitum. Light intensity was 0.1 Watt/m2 at head height and was scheduled for 23L:1D during the entire experimental period. Light treatments were: control: white (mini incandescent light bulb), blue (480 nm), green (560 nm) and red (660 nm). Body weight (BW) was recorded periodically and feed consumption was measured daily. At 5 days of age satellite cells were prepared from breast muscle of experimental chicks. In the 560 nm birds, a significant enhancement in weight gain was observed from 3 days old; this was maintained during the entire experimental period. Broilers reared under blue light were also significantly heavier than those reared under white and red light at 20 days of age and after. The number of satellite cells/g of breast muscle was higher in the 560 and 480 nm groups compared to the 660 nm and white control birds. In addition, growth hormone receptor gene expression was also higher in the former groups. In Exp. 2, 640 male broiler chicks (Anak) were divided to 7 treatment groups housed in 8 environmental light and light control rooms previously divided to 4 m2 sealed cells (20 chicks/cell). Light treatments were: 1) white control 2) 480 nm 3) 560 nm, 4) 480 nm then 560 nm from day 5 to 29, 5) 560 nm then 480 nm from day 10, 7) 560 nm then 480 nm from day 20 (4 cells). Light intensity and schedule were as in Exp. 1. Body weight, feed consumption, and satellite cell growth were recorded as in Exp. 1. Green light accelerated early growth, in addition a further increase in BW was observed in the group shifted from green to blue on 10 days of age. We conclude that monochromatic green light stimulates growth at an early age and blue at later one, thus allowing a possible combination of both monochromatic stimuli.