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## Partial replacement of soybean meal with *Moringa stenopetala* leaf meal enhances the organoleptic properties of internal egg qualities in Lohmann-tradition chicken breed

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### Abstract

Egg quality and sensory attributes might differ depending on the feed composition. This study was conducted to evaluate the effect of the substitution of soybean meal (SBM) with *Moringa stenopetala* leaf meal (MSL) on the organoleptic properties of the main internal egg qualities. Forty Lohmann-tradition layer chickens were randomly distributed to four treatment diets replicated four times with ten hens each. A white-maize-soybean meal-based diet was formulated to contain MSL at a rate of 0 % (MSL0), 3 % (MSL3), 8 % (MSL8) and 13 % (MSL13) by replacing the SBM. The feeding experiment was conducted for 22 weeks starting from 20 to 42 weeks of birds' age. Four organoleptic attributes related to the appearance, aroma, texture and flavour of eggs were evaluated. The evaluation was carried out in two sessions for two consecutive days using 18 untrained panelists but usual consumers of eggs. In each session, each panelist has received eight hardboiled egg samples (two eggs from each treatment) with a total of 144 eggs. Individual panelists assessed each egg using a five-point hedonic scale. Data were analysed with two-way ANOVA by fitting treatment diets and panelists as independent factors. Results indicated that eggs collected from hens fed with different levels of MSL had the most desirable aroma and flavour attributes than from those fed MSL0 ( $p < 0.05$ ). The albumen appearance was higher for eggs of MSL13 group than that of MSL0 (4.52 vs. 3.56 hedonic scales). The best yolk colour was observed from hens fed MSL13 and MSL8 diets with the corresponding hedonic scales of 4.94 and 4.44 and differed ( $p < 0.05$ ) from those fed the MSL0 (2.33). Eggs from MSL13 group were perceived as having the best flavour (4.72) as compared with the other groups ( $p < 0.05$ ). Eggs from MSL3 and MSL13 diets demonstrated significantly higher desirable aroma than those of the control group. In conclusion, replacing SBM with up to 13 % MSL significantly improved the organoleptic quality parameters related to appearance, flavour, aroma, and texture of hardboiled eggs. Further research on the chemical composition and its connection to the organoleptic quality parameters is recommended.

**Keywords:** Hardboiled eggs, hedonic scale, internal egg quality, *Moringa stenopetala* leaf, organoleptic attributes, soybean meal