

CLASSIFICATION OF EGGS FROM LAYING HENS FEEDING DIFFERENT DIETS USING E-NOSE, E-TONGUE AND SENSORY EVALUATION

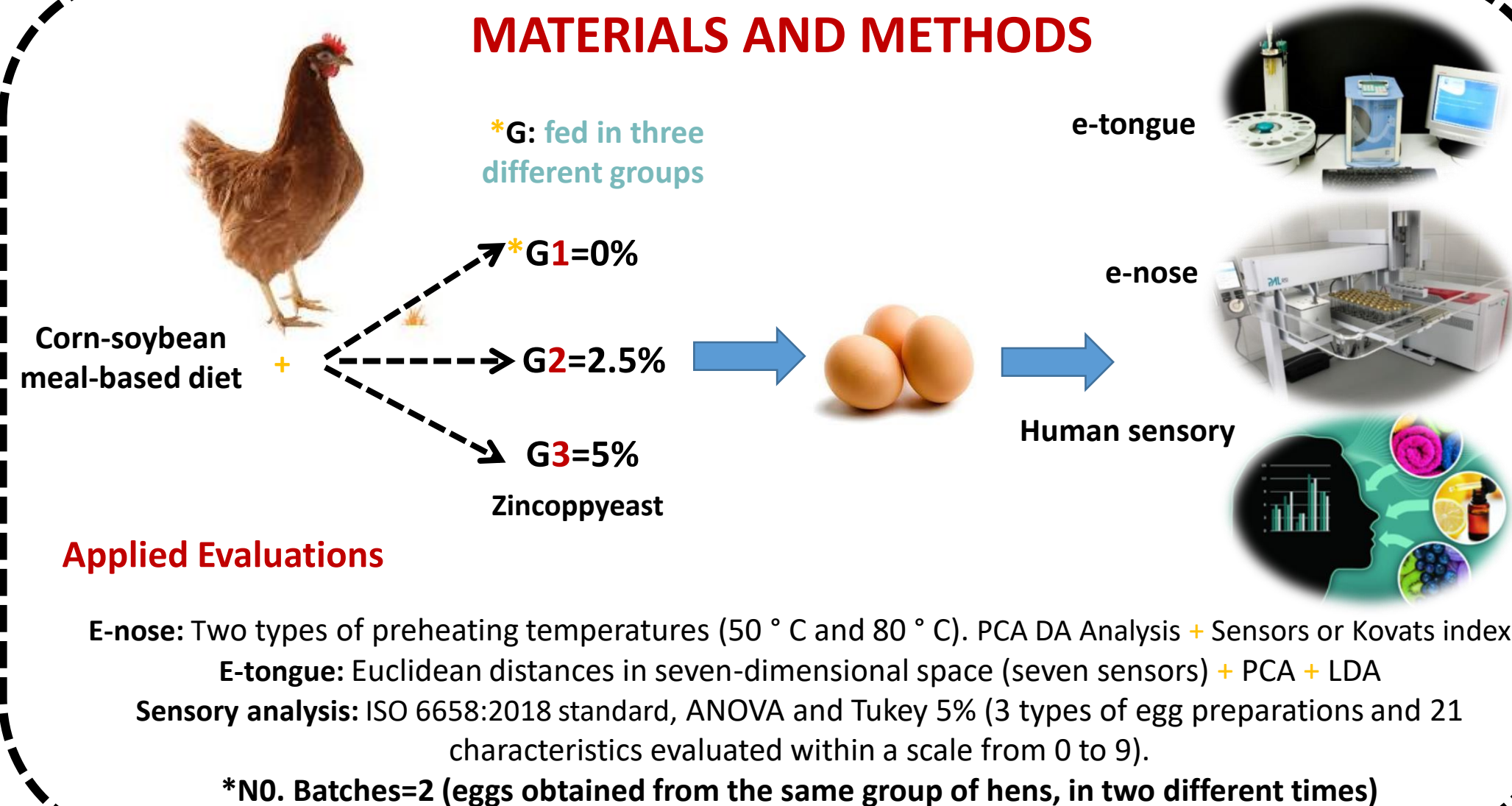
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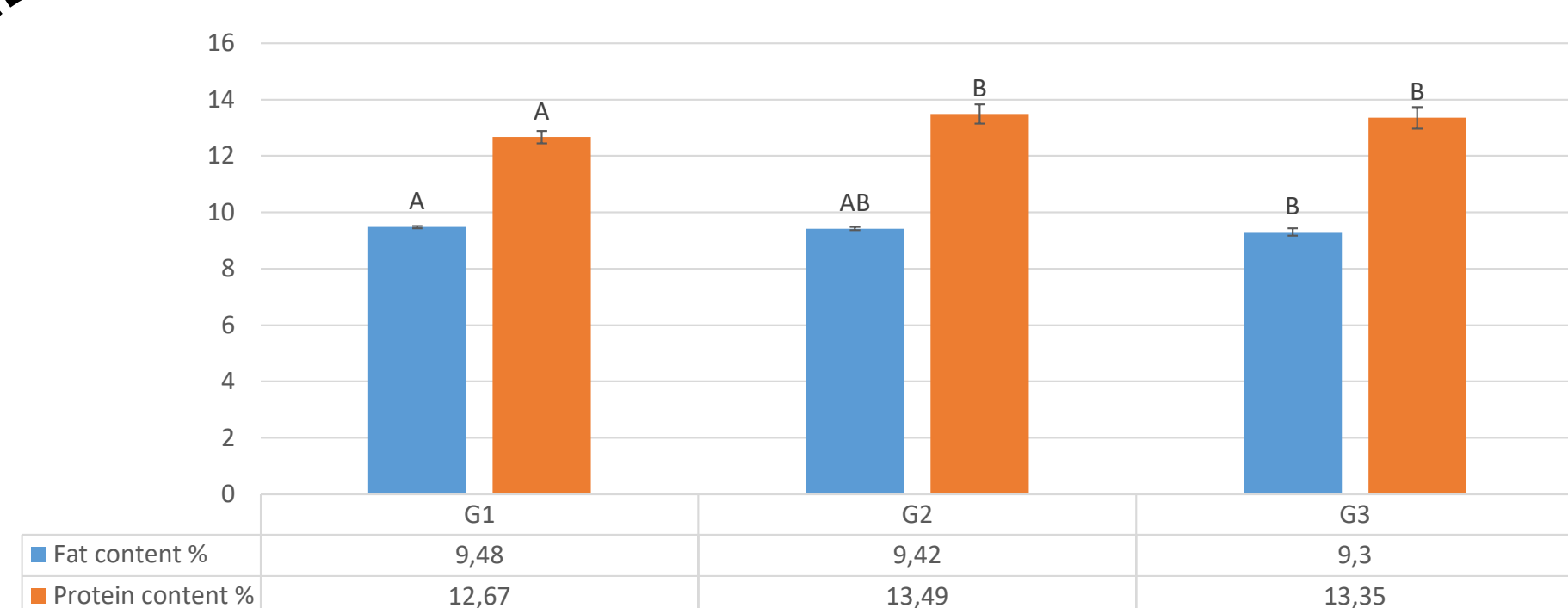
INTRODUCTION

- Eggs are worldwide consumed as they are considered one of the foods with more complete nutrients content for human diet.
- Several investigations have been made to procure high quality of eggs by increasing their nutritional value.
- Zincoppyeast (S.C. Agsira SRL) is a feed supplement enriched with organic zinc, polyphenols and vitamins.
- Laying hens' diets can influence sensory attributes of eggs.
- The aim of this study was to evaluate differences in the sensory attributes of eggs produced by hens feeding diets with different feed supplements (isocaloric and isonitrogenous corn-soybean meal-based diets).**

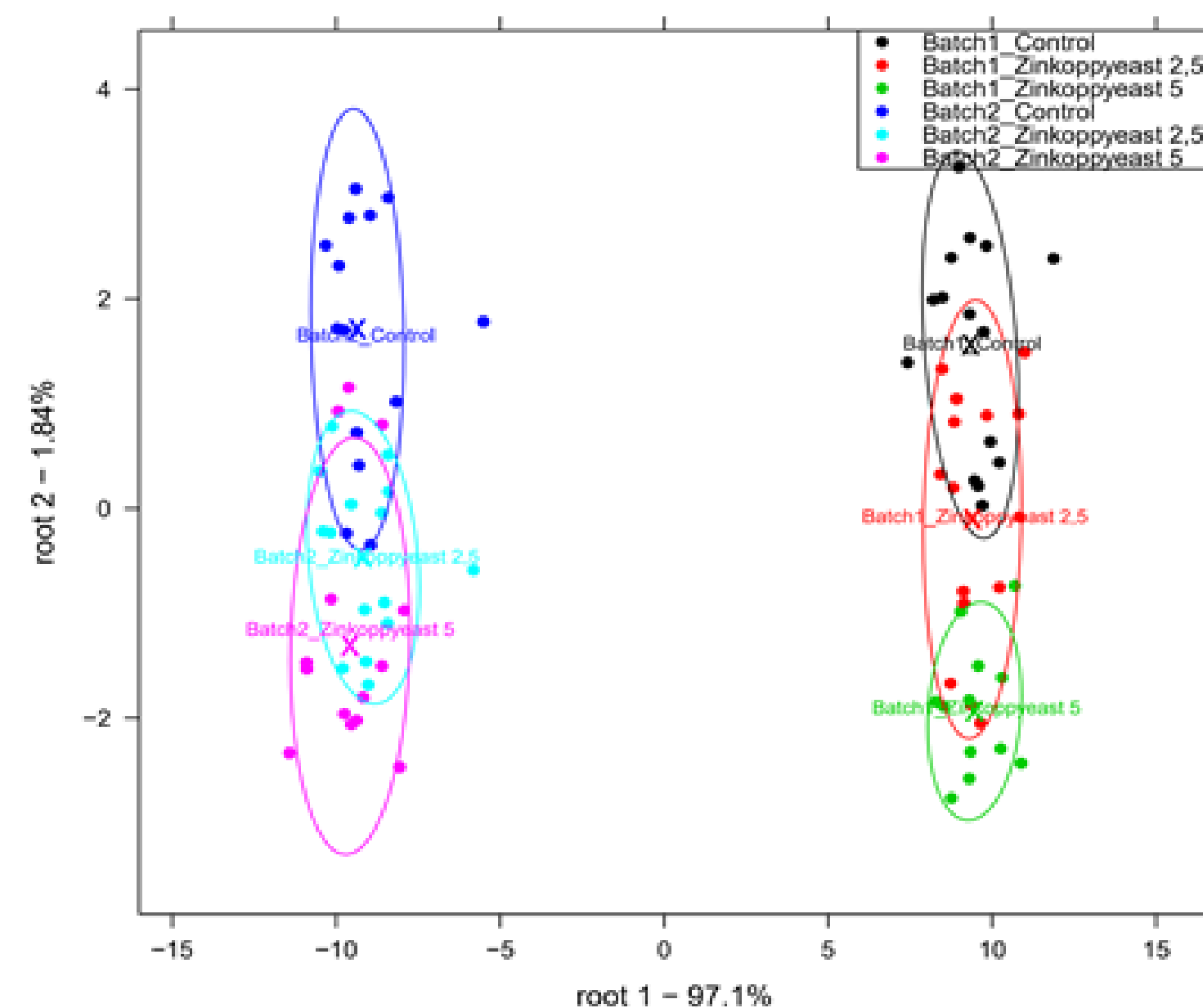
MATERIALS AND METHODS



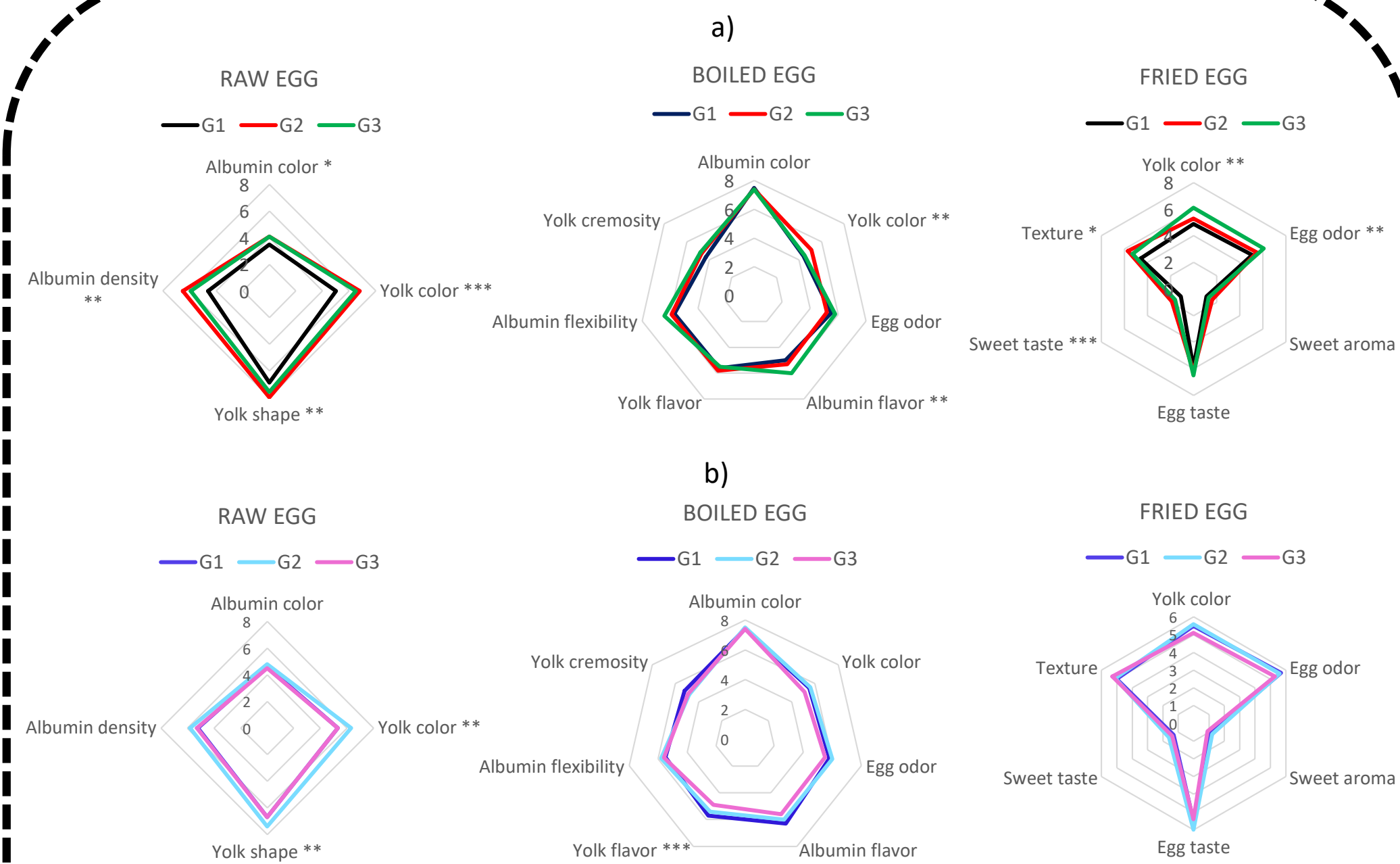
RESULTS



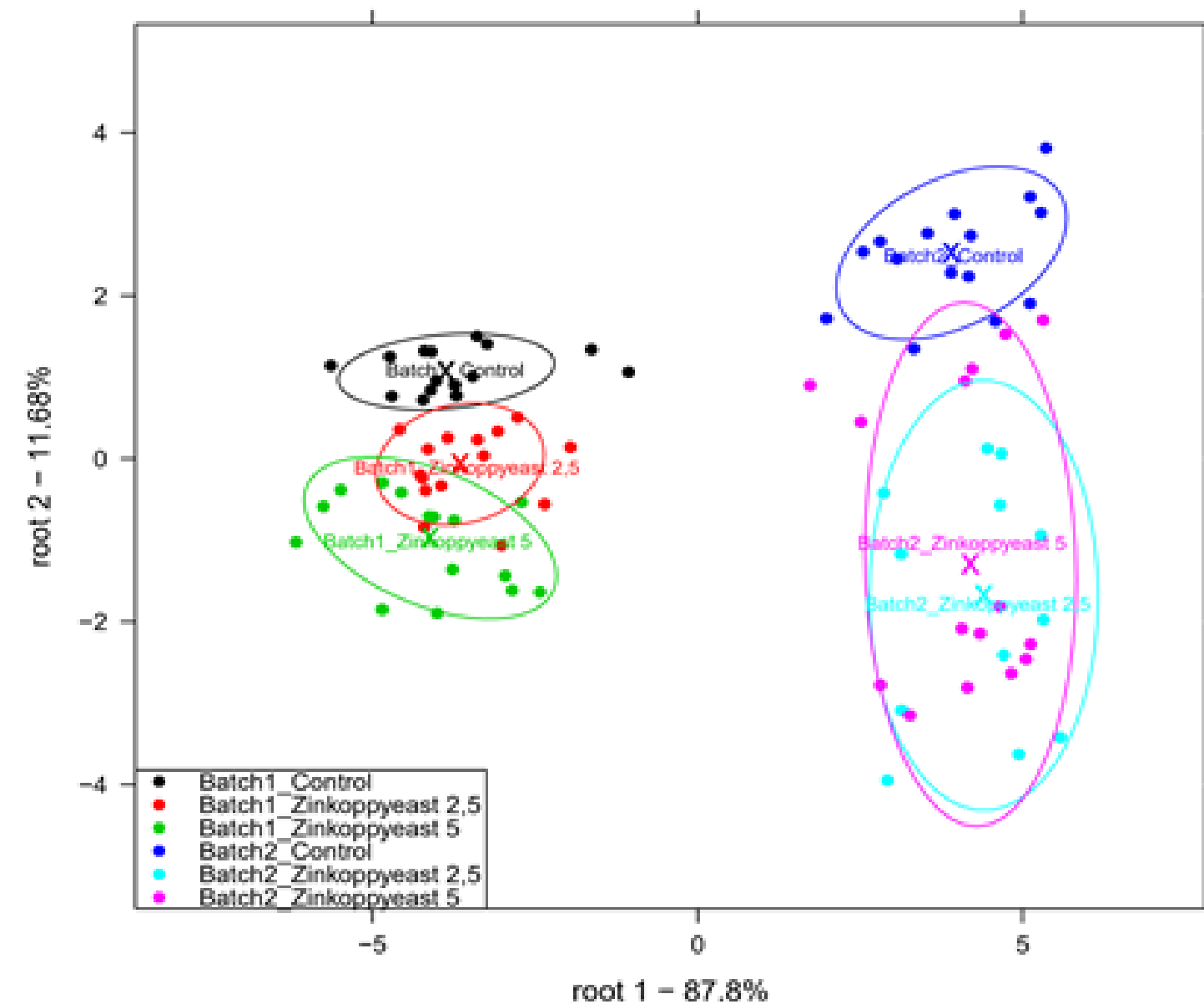
Chemical analysis: Fat and Protein content (%) of fresh egg samples grouped according to three feeding methods, difference sign. at $p < 0.05$



E-nose: PCA-DA discriminant analysis of fresh samples preheated to 50 ° C grouped according to three feeding methods, for two different batches.



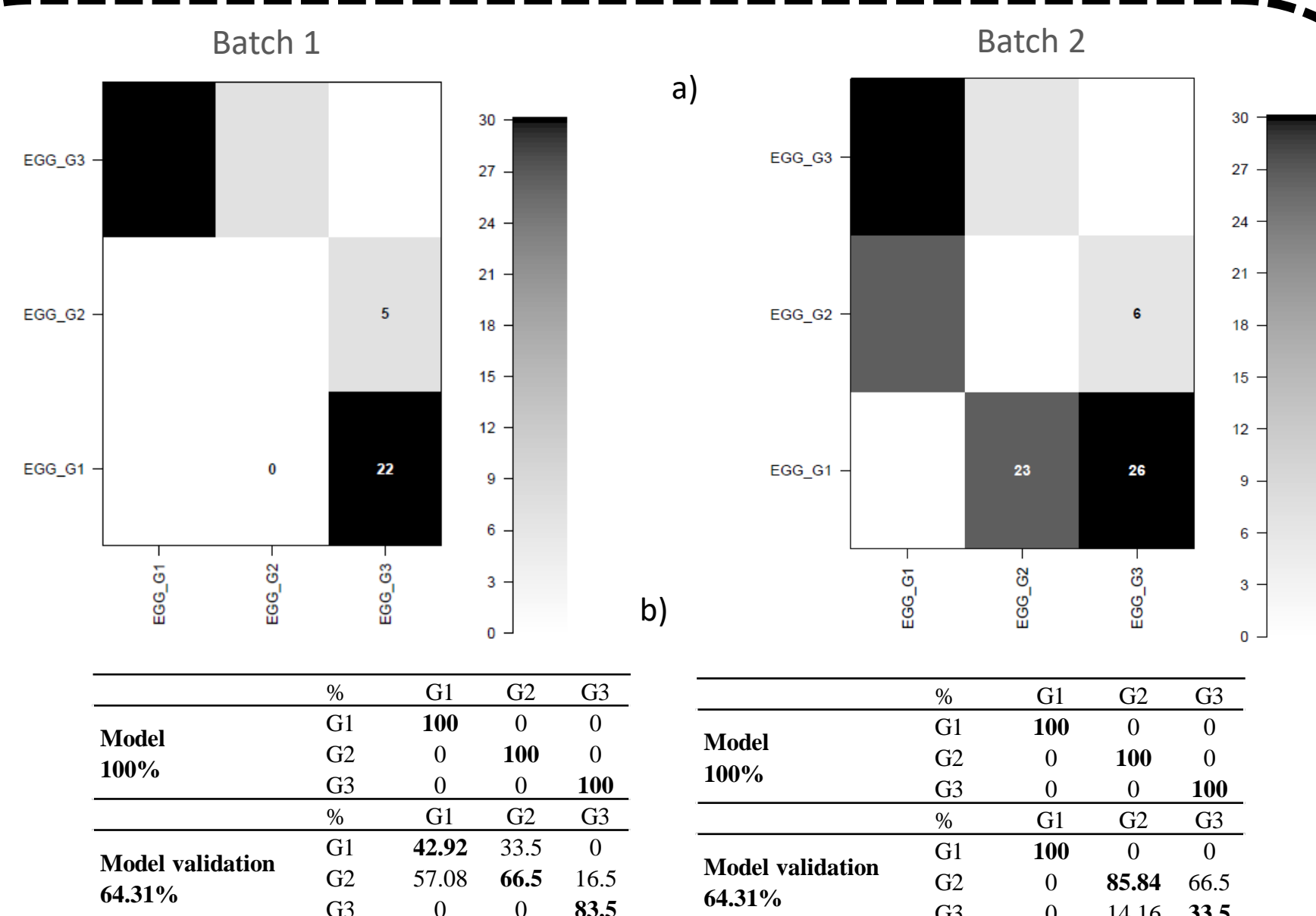
Human Sensory Analysis: for a) Batch 1, and b) Batch 2, for raw, boiled and fried egg parameters for 3 groups of eggs (G1, G2 and G3). Statistical calculated difference, $p > 0.05$ (ns), $p < 0.05$ (*), $p < 0.01$ (**), $p < 0.001$ (***) . Characteristics with value "0" in the evaluation scale are not presented (Strange odor and strange taste of boiled egg for boiled and fried egg)



E-nose: PCA-DA discriminant analysis of fresh samples preheated to 80 ° C grouped according to three feeding methods, for two different batches.

CONCLUSIONS

- From the chemical analysis, the feed supplementation significantly ($p < 0.05$) increased the protein content (from 12.7% to 13.4%) and decreased the fat content (from 9.5% to 9.3%) of egg."
- Based on the human sensory analysis with professional panel, the feed supplement had no clear and reproducible effect on the organoleptic indicators of boiled and fried eggs either.
- In the e-tongue analysis of G1, G2, and G3 eggs, perfect separation of G1 and G3 samples was observed, while misclassification occurred between G1 and G2, and between G2 and G3 samples.
- The results of the e-nose measurements suggest weak differences between the smell of the eggs belonging to the experimental groups, at both mild (50 ° C) and stronger (80 ° C) heat treatment, but these differences are compatible with the natural variance of egg production.
- Overall, at the applied doses, the tested feed supplement (0%, 2.5% and 5% Zincoppyeast) based on an industrial by-product (yeast biomass) did not have a clearly detectable effect on the organoleptic parameters of the eggs, based on neither instrumental nor human organoleptic tests.



E-tongue: a) Euclidean distances calculated in seven-dimensional space from electronic tongue sensor signals for the three groups of eggs. b) Cross-validation tables of the discriminant analysis models validated by triple cross-validation for the three groups of eggs.