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Characterization of eggs from Italian chicken breeds: preliminary bromatological results

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Introduction

From an environmental point of view, the use of local chicken genotypes is considered eco-friendly: indigenous breeds adapt better to local environments and a wide range of extensive breeding conditions, permitting them to be efficiently productive. In Italy, more than twenty chicken breeds are present and each of these originates from a specific part of the Italian territory: Piedmont (Bianca di Saluzzo, Bionda Piemontese), Lombardy (Mericanel della Brianza), Veneto (Ermellinata di Rovigo, Millefiori di Lonigo, Padovana, Pepoi, Polverara, Robusta Lionata, Robusta Maculata), Tuscany (Livorno, Mugellese, Valdarno and Valdarnese), Marche (Ancona breed) and Sicily (Siciliana breed).

Materials and methods

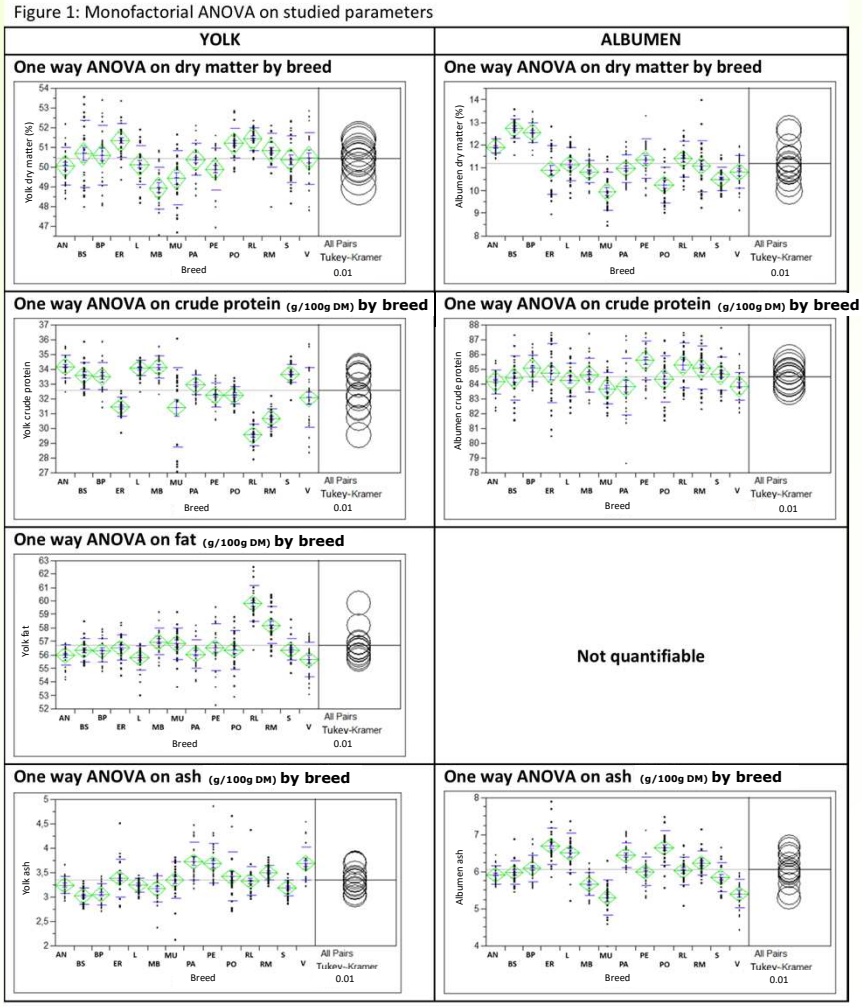
For this study, hens at the first reproductive cycle, coetaneous and fed on the same basal diet for local layers were used. Hens belonged to Ancona, Bianca di Saluzzo, Bionda Piemontese, Ermellinata di Rovigo, Livorno, Mericanel della Brianza, Mugellese, Padovana, Pepoi, Polverara, Robusta Lionata, Robusta Maculata, Siciliana and Valdarnese breeds. Twenty-five eggs per pure breed, laid in mid-May, were evaluated. A total of 350 yolks and 350 albumens of known weight were lyophilized and evaluated for dry matter (DM), crude protein (CP), ether extract (EE; only yolk) and ash contents according to the AOAC (1990). All data were submitted to one-way ANOVA for statistical comparison of means using JMP Statistical Discovery.

Results and discussion

Significant differences ($p<0.01$) between breeds were observed for all chemical parameters in the egg components. The yolk has the highest dry matter content in the Robusta Lionata and Ermellinata di Rovigo breeds (51.5% and 51.4%, respectively). These values result significantly higher ($p<0.01$) than those of two egg-type breeds, the Livorno and the Ancona, as well as those of the three local small-type breeds (Pepoi, Mugellese and Mericanel of Brianza).

The highest yolk CP was observed in the Ancona breed, significantly different from the Veneto region breeds (Ermellinata di Rovigo, Padovana, Pepoi, Polverara, Robusta Lionata, Robusta Maculata) and two Tuscany region breeds (Mugellese and Valdarnese). The lowest percentage of proteins in the yolk was detected in the medium-heavy type Robusta Lionata breed, similar only to the Robusta Maculata. The Robusta Lionata breed showed the highest fat content in the yolk (59.9%) significantly higher than that of all the other breeds ($p<0.01$). Yolk from Valdarnese breed appeared the less rich in EE (55.7%). The ash content in the yolk was between 3.7% and 3.0%, values recorded in the Padovana and Bianca di Saluzzo breeds, respectively ($p<0.01$).
The albumen DM was higher in the Piedmont region breeds (Bianca di Saluzzo and Bionda Piemontese) and the lowest values was observed in the Mugellese ($p<0.01$). Albumen CP content ranged from 85.6% to 83%; the highest value was in Pepoi, significantly different from Valdarnese, Padovana and Mugellese ($p<0.01$). Albumen ash content in Ermellinata di Rovigo, Polverara, Livorno e Padovana was higher than other breeds ($p<0.01$), while the lowest value was in Mugellese, Valdarnese and Mericanel della Brianza.

Figure 1: Monofactorial ANOVA on studied parameters



Conclusion

The present study evidenced the need to characterize products from local populations thus to discover their productive potentials able to promote their use and to sustain their conservation, being the local breeds determinant genetic sources in the preservation of global biodiversity.