

Laying performances and egg quality in two broiler breeder purelines divergently selected on their meat ultimate pH.

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ABSTRACT				
The selection of meat-type	e lines for increased growth and muscle development has been			
accompanied by significant physiological changes. While considerable gains have been made				
in production performances, there are limits in terms of product quality but also reproduction.				
There is therefore a real challenge to better understand and exploit, the elements of the				
compromise between production, reproduction and meat quality.				
The study focused on breeder hens at the 11th generation of selection, at which a differential				
of 0.5 pH unit is observed for the selection criterion (ultimate pH measured in chicken growing				
in the breast muscle at 6 weeks). Eighty females for the pHu+ and for the pHu- lines were				
housed in single cages in controlled environment from 20 to 40 weeks of age. During this period,				
eggs were weighted every week and eggshell mechanical properties (eggshell shape, percent,				
index, thickness, toughness, elasticity) have been determined to evaluate the egg quality for				
each line during all the laying period.				
Data collected between 23 and 39 weeks of age show a decrease in the laying rate, a first egg				
delayed and a higher percentage of broken eggs in the high pH line (pHu+, line presenting the				
lower energy status) by comparison to the low pH line (pHu-). Divergent selection also changed				
the characteristics of the eggs, resulting in heavier eggs and a higher shape index value (more				
round shape eggs) in the pHu+ line.				
In conclusion, these results suggest a deterioration in the reproductive performance studied				
and changes in the characteristics of eggs in relation to the decrease in energy storage caused				
by selection for an increase in pHu. These first observations pave the way for future				
genetic studies to evaluate the contribution of energy status in terms of improving reproductive				
traits whose degradation penalizes the meat-type sectors. In an original way, they also suggest				
the possibility of identifying new indicators or biomarkers of the energy status from measures				
related to reproduction and the egg.				