

© 2012 Universities Federation for Animal Welfare
 The Old School, Brewhouse Hill, Wheathampstead,
 Hertfordshire AL4 8AN, UK
www.ufaw.org.uk

Animal Welfare 2012, 21: 517-526
 ISSN 0962-7286
 doi: 10.7120/09627286.21.4.517

A field assessment of the effect of pre-slaughter conditions and genetic-stress susceptibility on blood welfare indicators in pigs

MD Guàrdia*[†], J Estany[‡], J Álvarez-Rodríguez[‡], X Manteca[§], M Tor[‡], MA Oliver[†], M Gispert[†]
 and A Diestre[#]

[†] IRTA, Centre de Tecnologia dels Aliments, Finca Camps i Armet, 17121 Monells, Spain

[‡] Departament de Producció Animal, Universitat de Lleida, Rovira Roure 191, 25198 Lleida, Spain

[§] Unitat de Fisiologia Veterinària, Universitat Autònoma de Barcelona, 08193 Bellaterra, Barcelona, Spain

[#] Pig Improvement Company, Avd Argüll 80, 08190 Sant Cugat del Vallés, Spain

* Contact for correspondence and requests for reprints: dolors.guardia@irta.es

Abstract

The effect of pre-slaughter handling conditions and the RYR1 gene on blood cortisol, lactate and creatine phosphokinase (CPK) levels at exsanguination were assessed using 2,923 surveyed pigs from 106 deliveries to five Spanish abattoirs across two seasons. The relationship between blood parameters, carcass skin damage and pork quality traits was also assessed. The season influenced blood cortisol, lactate and CPK values. Females always showed higher concentrations of cortisol, lactate, and CPK than males. Pigs carrying the recessive allele of the RYR1 gene exhibited increased lactate and CPK concentrations but not cortisol. The cortisol concentration decreased in lean pigs that were slaughtered in winter after short lairage periods. The lactate concentration decreased with loading time and increased in summer with lairage time and carcass lean content. The CPK concentration increased with lairage time, carcass weight, and carcass lean content, and with the duration of winter transports. Each truck delivery only explained approximately 10% of the variance in blood parameters. Lairage time is the most influential pre-slaughter handling practice on the assessed welfare indicators. In addition, different optimal lairage times might be appropriate depending on season. Blood cortisol, lactate, and CPK concentrations increased concomitantly with skin damage score. Blood parameters were weakly correlated and they also showed low association with pork quality traits.

Keywords: animal welfare, blood constituents, pre-slaughter, RYR1 gene, skin damage, swine