X
INTERNATIONAL
SYMPOSIUM
OF
MEDITERRANEAN PIG

16 -19 October, 2019
Florence, Italy

BOOK OF ABSTRACTS

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UNIVERSITÀ DEGLI STUDI FIRENZE
DAGRI
DIPARTIMENTO DI SCIENZE E TECNOLOGIE AGRARIE, ALIMENTARI, AMBIENTALI E FORESTALI

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Alentejano and Bísaro pigs and their crosses: genotype effect on loin traits

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Alentejano (AL) and Bísaro (BI), the two main Portuguese local pig breeds, cohabited in Ribatejo region for some time, but their crosses disappeared in the 1950's. Although appreciated, no scientific data is available regarding the Ribatejano (RI) pig (ALxBI or BIxAL) animals or their meat. In order to assess the meat quality of RI pigs, castrated male pigs from AL, BI, ALxBI and BIxAL genotypes were studied within the framework of the TREASURE project. Raised in a traditional free-range system and fed commercial diets *ad libitum*, ten pigs from each genotype were slaughtered at ~65 (Trial 1) and nine at ~150 kg live weight (LW) (Trial 2). *Longissimus lumborum* (LL) physical-chemical traits (pH_u at 24 h, intramuscular fat (IMF), myoglobin and total collagen) were measured and data statistical analyses were performed by one-way ANOVA. In both trials, BI, ALxBI and BIxAL attained slaughter weight faster, presenting higher ADG than AL pigs, but this difference was only significant ($P<0.001$) in trial 1 (65 kg). At 65 and 150 kg, % commercial yield was higher ($P<0.01$ and $P<0.05$, respectively) in BI than AL pigs, mainly due to heavier loin ($P<0.05$) and ham ($P<0.001$) weights in BI pigs. RI crosses presented intermediate values of those presented by the pure genotypes. Conversely, fat cuts ($P<0.01$) and backfat thickness ($P<0.001$) were higher in AL than in BI pigs in both slaughter weights, with RI crosses presenting again intermediate values. Physico-chemical data showed that AL pigs presented LL muscle with higher pH_u ($P<0.01$) (trial 1 - 5.57 *vs* 5.44; trial 2 - 5.72 *vs* 5.49) and IMF ($P<0.05$) (trial 1 - 6.7 *vs* 5.5; trial 2 - 6.9 *vs* 6.0), higher myoglobin ($P<0.05$) (trial 1 - 0.76 *vs* 0.54; trial 2 - 0.86 *vs* 0.45) and lower total collagen ($P<0.05$) (trial 1 - 13.9 *vs* 17.1; trial 2 - 13.1 *vs* 16.7) content than BI. This last parameter influenced meat tenderness, with lower Warner-Bratzler shear force values in AL than BI pigs (data not shown). As to RI pigs, overall they presented LL with intermediate pHu, slightly lower IMF (more pronounced in trial 1), and identical pigment content and tenderness than the ones of AL pigs. In conclusion, RI pigs presented intermediate traits between the fatter (AL) and the leaner (BI) genotypes. These first results on RI pig's LL traits, suggest their potential for the production of heavier loins than AL pigs, with identical rich colour and tenderness, and high quality dry-cured products. RI pigs could therefore be an alternative to the use of other breeds on commercial crosses, helping to increase the income of local pig producers, and also maintain or increase the pure breed populations, contributing to animal biodiversity.

Acknowledgements
This work was funded by European Union's H2020 RIA program (grant agreement no. 634476) and by Portuguese national funds through FCT/MCTES under project UID/AGR/00115/2019 and research grants SFRH/BD/132215/2017 to A. Albuquerque.

Effects of High Pressure on Properties of Meat Products

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Cured pork loin and *"Chouriço de carne",* both traditional ready-to-eat (RTE) meat products, from Iberian and Alentejano pigs, were processed by a cured drying stage followed or not by smoked stage, are characterize by the use of red pepper and garlic. This study aim was to evaluate the effect of high-hydrostatic pressure (HHP) process (600 MPa/8 min) and posteriours storage at 4^0 and 20 ºC for 6 months in the meat products quality. The analyzed parameters along the storage period were: microbiological analysis – Mesophile aerobics, Lactic bacteria, *S. aureus*, *Salmonella* and *L. monocytogenes*, *E. coli*, *C. perfrigens*, coliforms and molds and yeasts; physical-chemical analysis – Instrumental color (L*a*b*), lipid oxidation and protein oxidation; sensory descriptive analysis - meat color, smell intensity, undesirable smell, hardness, juiciness, salty taste, sour taste, sweet taste, spicy taste, taste intensity, cured aroma and rancid aroma. In the microbiological analysis of *"chouriço de carne"* after HHP, it had been shown the lowest mesophils count at 20 ºC. The lactic bacteria had significant differences ($p<0,01$) along all storage in the cured loin, however the yeasts and molds had only differences at 90 and 180 days. *E. coli*, *C. perfrigens*, *Salmonella* and *Listeria* had presented results within the recommendable limits (<1 log UFC/g) as well as the *S. aureus* (<2 log UFC/g) in both RTE meat products. In the color parameters, temperature had shown influence in cured loin at 180 days in a* and b*, however HHP had influenced L* at both temperature. In *"chouriço de carne"*, a* had shown differences at day 0. With reference to lipid oxidation, the cured loin had presented significant different values with HHP at 180 days. In HHP *"chouriço de carne"* protein oxidation had shown differences at 20ºC. However, neither the temperature nor the treatment had influenced lipid oxidation. In terms of cured loin sensory analysis, neither by temperature, nor by the treatment nor even by the storage time had affected the color, nevertheless smell intensity had been affected by all those factors. The hardness had been affected just by storage period, which was also the main factor to influence the decrease in sweet and spicy taste. Cured aroma had significantly higher scores at 90 days and rancid had shown differences at 20 ºC without HHP. In relation to *"chouriço de carne"*, color had not been affected along the study, however the smell intensity had been by all factors (temperature, HHP and storage time), hardness was only affected by storage period and sour, spicy and sweet taste had not been affected by HHP but by storage presenting a decrease in scores along time. Also, cured aroma had significant differences along time, but rancid only had with storage time. Overall, this study suggested in some quality parameters the suitability of this novel approach for commercial adaptation, namely in microbiologically safety since it had presented for a long period of storage, levels of pathogenic below the expected ones.