WCCE11 - 11th WORLD CONGRESS OF CHEMICAL ENGINEERING
IACCHE - XXX INTERAMERICAN CONGRESS OF CHEMICAL ENGINEERING
CAIQ2023 - XI ARGENTINIAN CONGRESS OF CHEMICAL ENGINEERING
CIBIQ2023 - II IBEROAMERICAN CONGRESS OF CHEMICAL ENGINEERING
Buenos Aires - Argentina - June 4-8, 2023
BUENOS AIRES 2023
JUNE 4 - 8
"The global chemical engineering working for a better future world"

Valorization of tough meat samples into new beef products

Sara Ricardo-Rodrigues[1], Sofia Silva[2], Maria Inês Rouxinol[1], Maria Eduarda Potes[1,3], Ana Cristina Agulheiro-Santos[1,4], Marta Laranjo[1], Miguel Elias[1,4*]

[1] MED-Mediterranean Institute for Agriculture, Environment and Development & CHANGE – Global Change and Sustainability Institute, Institute for Advanced Studies and Research, Universidade de Évora, Pólo da Mitra, Ap. 94, 7006-554 Évora, Portugal
[2] Departamento de Química e Bioquímica, Escola de Ciências e Tecnologia,Universidade de Évora, Pólo da Mitra, Ap. 94, 7006-554 Évora, Portugal
[3] Departamento de Medicina Veterinária, Escola de Ciências e Tecnologia, Universidade de Évora, Ap.94, 7006-554 Évora, Portugal
[4] Departamento de Fitotecnia, Escola de Ciências e Tecnologia, Universidade de Évora, Ap. 94, 7006-554 Évora, Portugal
* elias@uevora.pt

Cachena is a Portuguese cattle breed, mainly distributed in the Alentejo, a poor agricultural region in southern Portugal. Animals are small, and the meat has an excellent flavour. However, some heterogeneity has been reported regarding meat tenderness. To valorize tough meats inadequate for fresh consumption, new meat products, such as "cabeça de xara" (CX), can be developed. CX is a meat product traditionally manufactured with pork head and fat, consumed in Alentejo due to its organoleptic characteristics [1].

Our aim was to characterize two new meat products inspired by the traditional CX: one with 'Cachena' beef only (CX1), and another with 'Cachena' beef and pork (50:50) (CX2). Three independent batches of each product were prepared, and analyses were performed with the end-product and at the end of the estimated shelf life (60 days). Samples were stored under vacuum at 4°C. Microbiological analyses (*Salmonella* spp., *Listeria monocytogenes* and *Clostridium perfringens*), proximate composition analysis (dry matter, ashes, lipids, protein, carbohydrates, and energy), biogenic amines (BA) profile (tryptamine, β-phenylethylamine, putrescine, cadaverine, histamine, tyramine, spermidine and spermine), and sensory evaluation were performed. Data were statistically analyzed using ANOVAand Tukey's HSD test ($P<0.05$). The presence of *Salmonella* spp., *L. monocytogenes* and *C. perfringens* was not detected in end-products. The two products have distinct proximate compositions. CX1 has lower lipid (2.98%±0.90) and protein (21.67%±0.98) content, and higher moisture (72.22%±1.61) and ashes (2.49%±0.57). CX2 shows the highest energy value (169.24 kcal/100g±7.01), against 116.02 kcal/100g±9.11 of CX1. The BA profile revealed a higher abundance of putrescine and espermidine on CX1; putrescine and histamine on CX2. For the end-product, β-phenylethylamine showed the lowest abundance for CX1 and tiramine for CX2. These BA values were expected for this type of meat product. The addition of pork triggers a higher production of BA, which contributes to a decrease in quality in CX2. Regarding sensory evaluation, a significant increase in the occurrence of off-colors, off-odours and off-tastes was reported for 60-days shelf life samples. The sensory panel reported a discolored and faint whitish colour and an acid or vinegar odour for CX2, whileCX1 samples showed an excessive brown colour. Overall evaluation was initially around 70 (scale from 0 to 100) for both products but dropped to 58 at the end of the estimated shelf life.

Low valorized Cachena beef, otherwise rejected due to low tenderness, can be used in the manufacturing of CX. Sensory evaluation revealed a high acceptance of the new products towards commercialization. Nevertheless, it is important to consider a shorter shelf life (<60 days), to ensure food safety and prevent the deterioration.

Work supported by project PDR2020-1.0.1-FEADER-030803, funded by national funds (FCT/MCTES) and co-funded by the ERDF. S. R.-R. acknowledges a PhD grant from FCT (2021.07663.BD).

References

1. Laranjo, M., Potes, M.E., Gomes, A., Véstia, J., Garcia, R., Fernandes, M.J., Fraqueza, M.J., Elias, M. (2019). Shelf-life extension and quality improvement of a Portuguese traditional ready-to-eat meat product with vinegar. *Int J Food Sci Technol,* 54, 1