

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

## METABOLOMICS OF FRESH, WET-AGED AND DRY-AGED BEEF FROM CULL COWS

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Of the total cattle slaughtered in Brazil from 1996-2014, between 38 to 49% are females, and among them 78% were cull cows. However, there is limited information in the literature about meat quality on this animal category. It is widely recognized that the maturation process reduces the shear force, modifying the tenderness and flavor. Therefore, the present work aims to identify major changes in the metabolomic profile of cull cow's beef subjected or not to two different aging techniques (Dry-aging or Wet-aging). There were used 12 Nellore cull cows, with age varying from 6 to 15 years and average body weight of 467 kg. The animals remained in continuous grazing without supplementation for two months after weaning of their calves, and later they were slaughtered. Two steaks were removed between 12th and 13th ribs considered as the sample without aging (WA); in addition, the 9th–11th rib section also was removed and randomly assigned to one of the aging treatments. On Dry-aging, the rib-section was aged on air, without plastic bag, while on Wet-aging treatments, rib-section was vacuum packed in commercial plastic vacuum bags. The rib-sections were kept under the same cooling room at 4° C and 85% of relative humidity, for 14 days. After aging, muscle samples were collected and grounded under liquid nitrogen using a mortar and pestle. The polar metabolites were extracted and injected on a Gas chromatography mass spectrometry (TruTOF Agilent) to identify the peaks through the deconvoluted spectra obtained using the software TagSearch and the MetaboAnalyst 3.0. The T-test were used compare metabolites concentration between the treatments ( $P < 0.05$ ). Significant differences were found for 25 metabolites ( $P < 0.05$ ). Of these, four had a higher concentration ( $P < 0.05$ ) in the un-aged meat (Glucose, Glucose-6-phosphate, IMP and D-Ribulose-5-phosphate); while of the remaining, only four differed between the aging treatments (Melanic acid, Methionine and Putrescine were more abundant ( $P < 0.05$ ) in the Wet-aged and Saccharopine in the Dry-aged meat). Several studies have related these metabolites to overall acceptability of beef, although it varies among consumers from different countries. It is concluded that the Dry-aging of beef from cull cows decrease metabolites related to off-flavor on aged beef, nonetheless, more studies are necessary to evaluate the acceptance of those ageing methods on Brazilian consumer acceptance.

**Keywords:** Dry-aging, flavor, inosine monophosphate, Wet-aging.

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