Estimation of Dry-Cured Iberian Ham Quality Using Magnetic Resonance Imaging

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Abstract

The ham from Iberian pigs is a meat product of high sensorial quality, with a first-rate consumer acceptance. Its excellent sensorial characteristics are basically due to the extensive feeding system of Iberian pigs, based on acorns and grass, and the prolonged technological processing of the ham (18-24 months). Iberian hams present high intramuscular fat content and marbling. Currently, chemical processing is the only proved way to determine fat level, but this technique is destructive, time-consuming, expensive and unable to offer information about intramuscular fat distribution [1]. Traditionally, trained human testers determine ham sensorial quality over some pieces [2]. So, the design of a faster, non-destructive and objective methodology to classify Iberian ham from the viewpoint of sensorial quality would be of great interest to Iberian ham industries.

On other hand, in many medical applications, magnetic resonance imaging (MRI) is a common non-invasive technique to view inside bodies for the purpose of medical diagnosis [3]. Our attempts are to determine Iberian ham quality by analysing its tissues using MRI. In previous work, computer vision and pattern recognition techniques have been applied to ham slices in order to evaluate intramuscular fat content and ham marbling [4], [5]. The results obtained are quite encouraging. Nevertheless, although these methods do not destroy the samples, it is necessary to extract a slice and the piece is cut. In this paper, preliminary results obtained after analysing MRI dates of ham are presented and discussed. For illustrative purposes, figure 1 shows a MRI coronal section of a ham and the results obtained after automatic processing by our algorithm, where marbling is represented as white regions against a black background.

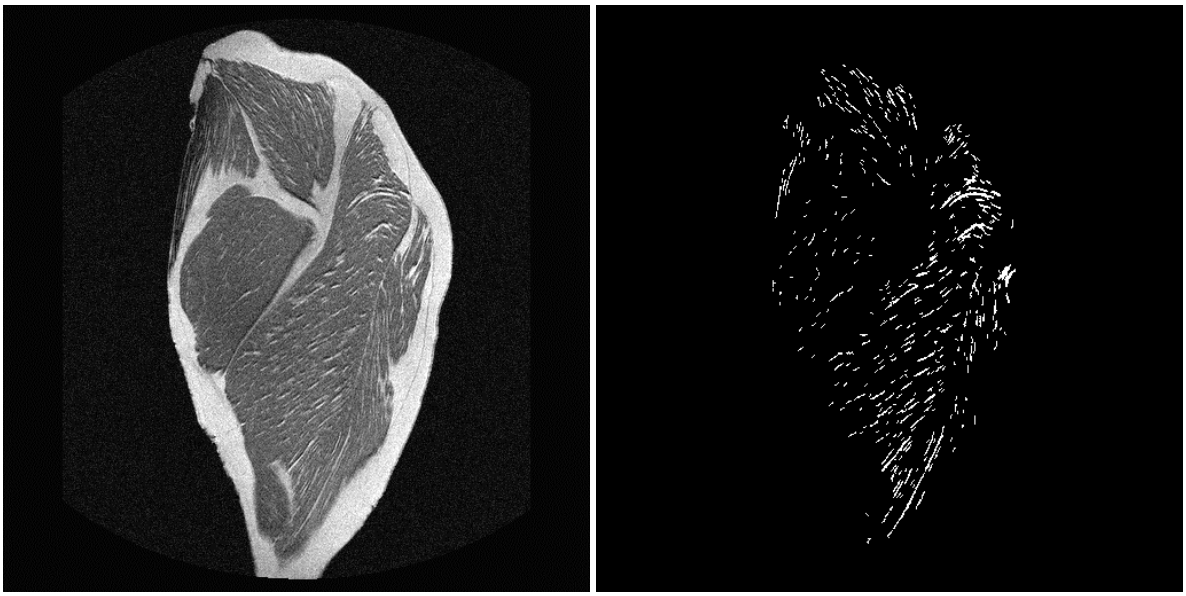

Figure 1. MRI coronal section of an Iberian ham (left) and result obtained afer automatic processing by our algorithm (right).

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