Title Image analysis application for automatic quantification of intramuscular connective tissue in meat

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Abstract

An image analysis application for the quantification of meat intramuscular connective tissue (IMCT) and fibre retraction is presented. This image analysis method was applied to microscopic images of Sirius red-stained tissue sections from various animal species (pig, cow, pigeon, and lamb), including different breeds of pig (Large White crossbreed and Iberian) and cow (Kobe and Rubia Gallega). Results obtained showed statistically significant differences among the species in area and percentage of IMCT, *perimysium* and fibre retraction in meat ($p < 0.001$, Kruskal–Wallis). Significant differences were also observed between the two breeds of pig in percentages of IMCT (4.00 ± 2.15 *vs*. 17.02 ± 14.99; $p = 0.028$, Mann–Whitney *U* test) and *perimysium* (22.59 ± 0.87 *vs*. 9.93 ± 4.95; $p = 0.009$, Mann–Whitney *U* test) in *longissimus thoracis* (LT). This original design software permits the accurate, objective, reliable, and fully reproducible quantification of IMCT and fibre retraction in meat.