基于KFCM和改进分水岭算法的猪肉背最长肌分割技术 Segmentation of Pork Longissimus Dorsi Based on KFCM Clustering and Improved Watershed Algorithm

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关键词： 无损检测 图像分割 猪肉 背最长肌 核模糊C均值聚类 分水岭算法

摘　要： 提出一种利用核模糊C均值聚类（KFCM）和改进分水岭算法分割猪肉眼肌切面图像中背最长肌区域的方法。该算法对经中值滤波去噪后图像的R分量利用最大方差自适应阈值（OTSU）去除背景，再采用KFCM提取出肌肉组织，然后进行空洞填充，最后由改进的分水岭算法分割出背最长肌区域。利用该算法对采集的60幅猪肉眼肌图像进行处理，分割正确率为86.67%；与传统的形态学算法相比，该算法能真实、完整地恢复出背最长肌区域。结果表明:该算法能有效地分割出猪肉眼肌图像中的背最长肌区域，与改进前分水岭算法相比，能避免背最长肌区域出现欠分割。 A method for automatic segmentation of pork longissimus dorsi muscle (MLD) region from rib-eye image was developed using KFCM clustering and improved watershed algorithm. Firstly, median filter and OTSU were used to remove noise and background. And then, kernel fuzzy C-means clustering (KFCM) was applied to remove fat pixels. Finally, hole filling operation and improved watershed algorithm were employed to segment the area of MLD. Sixty samples were used to test the performance of the proposed method. The success rate of segmentation was 86.67%. Compared with the traditional morphology and watershed methods, it is proved that the developed method could segment MLD region perfectly and avoid under-segmentation effectively.

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