

A pan-European computed tomography procedure for measuring the new EU lean meat content of pigs



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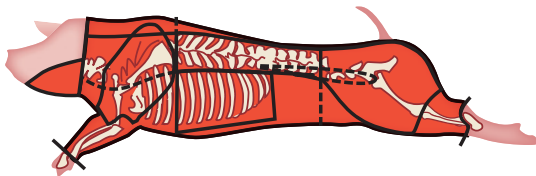
A new EU regulation on carcass classification applies from July 2018. The new reference to calibrate the pig classification methods is a lean meat percentage based on total dissection (LMPtd). Manual dissection can be replaced by an unbiased computed tomography (CT) procedure. If the national pig population to be sampled has the same characteristics as the population for which a CT procedure has been previously corrected, no additional dissection is required. The aim of this paper is to propose a pan-European CT procedure to calibrate the pig classification methods without any additional manual dissection.

Material & Methods

- Sample of 29 pig half-carcasses: 50% females & 50% males
- Scanned with an X-Ray tomograph (CT): 3 mm slice thickness (5 mm, about 450 images)



- Normalized EU cutting



- Full dissection of all primal cuts

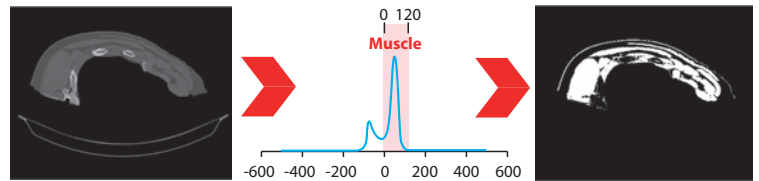


Example of belly dissection

- Calculation of LMP (Lean Meat Percentage) from dissection:
 $LMPtd = 100 \times (\text{Side muscle weight} / \text{Side weight})$

Image analysis

- Calculation of LMP (Lean Meat Percentage) from scanner
- Tissue segmentation on the Hounsfield scale: [0, 120] for muscle

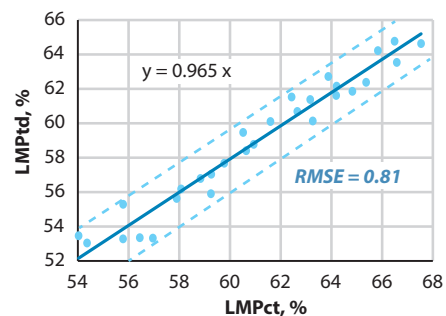


- Application of an average tissue density: 1.04 for muscle
- Conversion into percentage

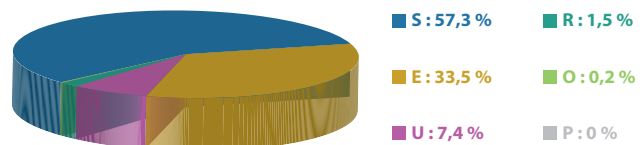
$$LMPct = 100 \times 1,04 \times \text{Side muscle volume} / \text{Side weight}$$

Results

- Regression of LMPtd (dissection) on LMPct (scanner): intercept not significant, slope < 1 (probably because of mixed voxels including rind)



- More than 90% of the EU pigs are graded in S (≥ 60) or E (55-59), which is covered by the LMPtd range in the sample (53-68)



Distribution of EU pig carcasses in SEUROP classes in 2016 (Source:EC)

Conclusion

The proposed CT procedure can be used in the EU to calibrate the national classification methods. The LMP of a carcass should be multiplied by 0.965 to be scaled with the manual dissection. As this coefficient is robust against variation in fatness, it could be applied in almost all of the EU Member States, without any additional national dissection. This procedure can therefore be qualified as a pan-European CT procedure to determine the lean content of pig carcasses.

