

Retrospective by sex of the new EU lean meat content of pig carcasses



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A new EU regulation on carcass classification applies from July 2018. This regulation changes the definition of the reference lean meat percentage (LMP) which becomes the LMP in the carcass (from total dissection). Nevertheless, each Member State can choose when he will update its grading methods. The aim of this work is to simulate this change on the last 5 years in France for each sex.

Material & Methods

Material

- Sample of 180 pigs uniformly stratified on sex
 - 60 females
 - 60 entire males
 - 60 castrated males

Methods

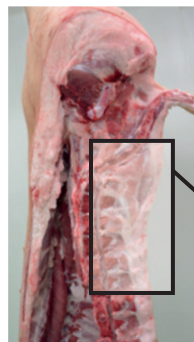
- Scan of half-carcass (3 mm slices)
- Calculation of LMP (Lean Meat Percentage):
 - Tissue segmentation on the Hounsfield scale: [0, 120] for muscle
 - Application of an average tissue density: 1.04 for muscle
 - Conversion into percentage
 - Scaling with dissection by multiplying by 0.965
- Development of a LMP prediction equation by linear regression:
 - From the 4 Image-Meater depths with interaction with sex
 - Stepwise procedure with BIC criterion
- Use of the LMP equation on the French annual means of Image-Meater classification data, i.e. on about the ¼ of the slaughtering (18 millions), between 2013 and 2017

Results

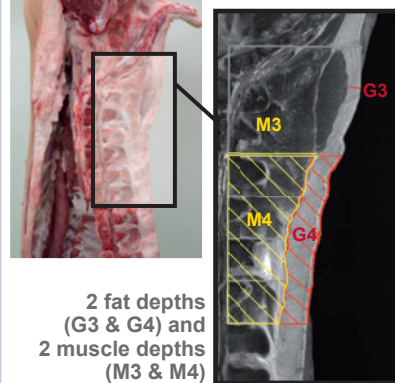
- Selected LMP model
 - 1 fat depth (G3) and 2 muscle depths (M3 and M4)
 - G3 and M3 slopes were sex dependent
 - G3 slope: twice for entire males compared to females
 - M3 slope: twice for entire males compared to castrates and females
 - RMSE = 2.15 (2.16 without M4)
- LMP prediction:
 - decrease 2013-2017 of differences between entire and castrated males: from 4.0 to 3.8
 - entire males and females: from 1.4 to 1.2

Material & Methods

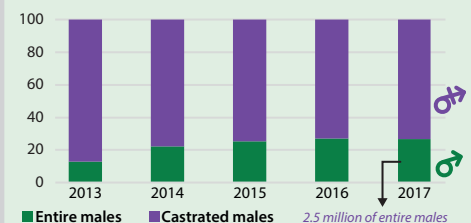
Half-carcass



The grading system CSB Image-Meater

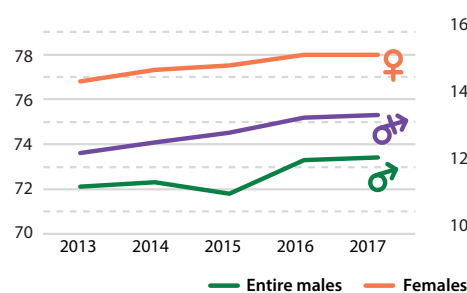


Yearly evolution of entire and castrated males in the males proportions

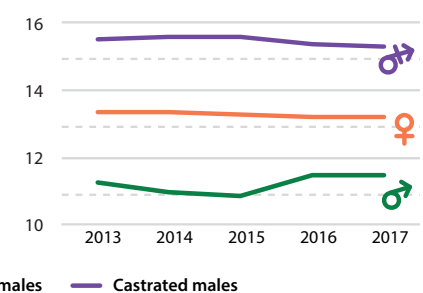


Results

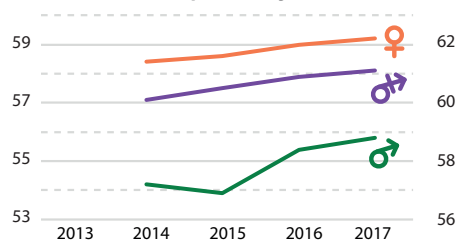
Evolution of annual mean muscle depth M3 by sex



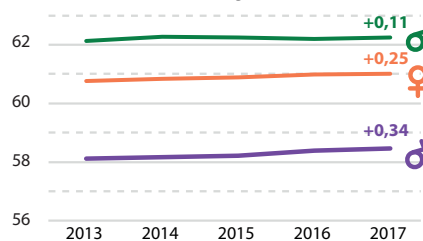
Evolution of annual mean fat depth G3 by sex



Evolution of annual mean muscle depth M4 by sex



Evolution of annual mean LMP by sex



Conclusion

- The prediction equation of the lean meat content in pig carcass from splitline measurements is sex-dependent. The slopes of both fat and muscle depth are affected. When the Image-Meater method will be updated, it seems worthwhile to consider separate slopes for entire males, females and castrated males.
- In four years the differences of lean meat content between sexes have slightly been reduced.

