

SIMULATION OF THE IMPACT OF AN INCREASED PROPORTION OF ENTIRE MALE PIGS ON THE COMPOSITION OF PORK CUTS



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The EU regulation banning castration of pigs without anaesthesia and its current implementation in several countries should provoke an increase in the production of entire males. As castration has an important effect on the fat distribution and the body composition in general, a great change in the composition of pork cuts is expected. In order to quantify such changes, the composition was assessed according to several scenarios including an increased proportion of entire male pigs.

Material & Methods

- Sample of 180 pigs
- 3 sexes in the same proportions: 60 entire males (EM), 60 gilts (F) and 60 castrated males (CM)
- 2 halothane genotypes (NN or Nn)
- Normalised industrial cutting
- 4 primal joints scanned by Computed Tomography (Fig. 1 & 2) to measure the weights of muscle, fat and bones

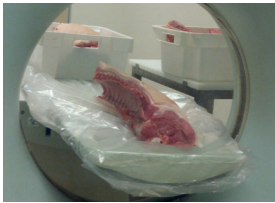


Fig.1 – Scanning a loin

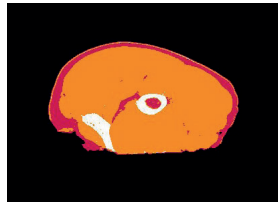


Fig.2 – Displaying tissues on a ham slice

- Calculation of tissues contents by cut (Daumas & Monziols, 2021)
- LSmeans estimated by a general linear model including sex and halothane genotypes as fixed effects. Tukey test to detect differences
- Simulation of several scenarios including the extreme ones:
 - 50% of EM in the national population
 - 0% of EM in the national population

Results

- Significant sex effect on all tissue contents of the 4 cuts
- Significant differences between the 3 sexes for most muscle and fat contents (Fig. 3)
- Same hierarchy of muscle % for all cuts: EM > F > CM
- Large differences of muscle % between EM & CM (Tab.):
 - +7.9 percentage points in belly
 - +5.4 percentage points in loin
 - +5.2 percentage points in shoulder
 - +3.1 percentage points in ham
- EM (vs F & CM): higher bone content in ham
- CM (vs F & EM): lower bone content in loin, belly & shoulder

Reference

- Daumas, G., & Monziols, M. (2021) Tissue composition of industrial primal cuts and impact simulation of an increased proportion of entire male pigs. Journées Rech. Porcine, 53, 43-48.



Conclusion

An increasing proportion of entire males will:

- decrease the fat content of the primal cuts,
- increase their muscle and bone contents,
- impact the belly the most,
- impact the ham the least.

Generalization of entire males would cause a 3-point increase in the average muscle content in French bellies.

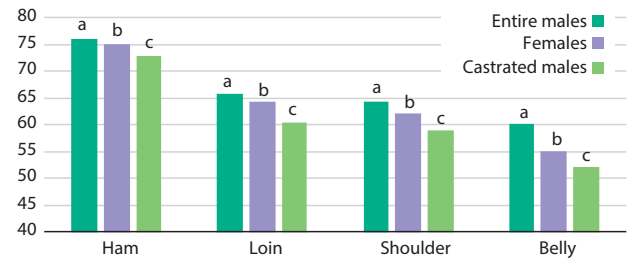


Fig.3 – LSmeans of % of muscle in the 4 cuts by sex

Tab. – LSmeans of tissues content for males (Entire, Castrated, Difference)

CUT	Tissue content	EM	CM	EM - CM
Ham	% of muscle	76.0	72.9	3.1
	% of fat	11.1	14.9	-3.8
	% of bone	8.9	8.3	0.6
Loin	% of muscle	65.8	60.4	5.4
	% of fat	19.1	25.2	-6.1
	% of bone	11.1	10.4	0.7
Shoulder	% of muscle	64.3	59.1	5.2
	% of fat	18.5	23.8	-5.3
	% of bone	11.2	11.1	0.1
Belly	% of muscle	60.2	52.3	7.9
	% of fat	26.7	34.9	-8.2
	% of bone	5.5	5.3	0.2

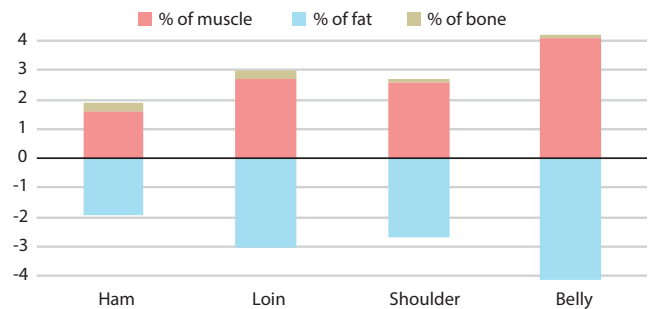


Fig.4 – Differences of tissues content by cut between extreme scenarios (50% vs 0% entire males)

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