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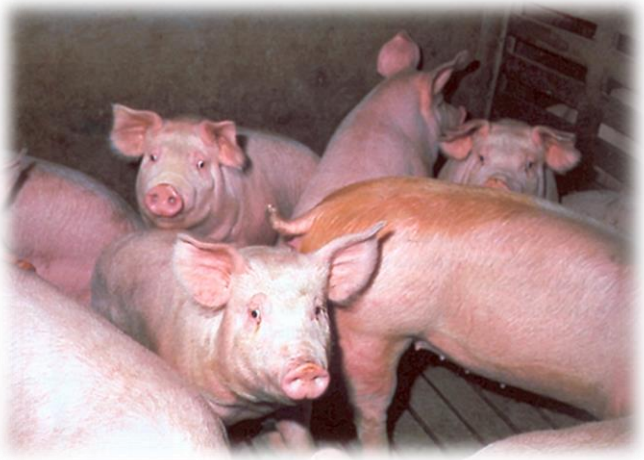
Meat and fat quality of pigs intended for Spanish cured ham: effect of male castration and feeding



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Introduction

Boar taint

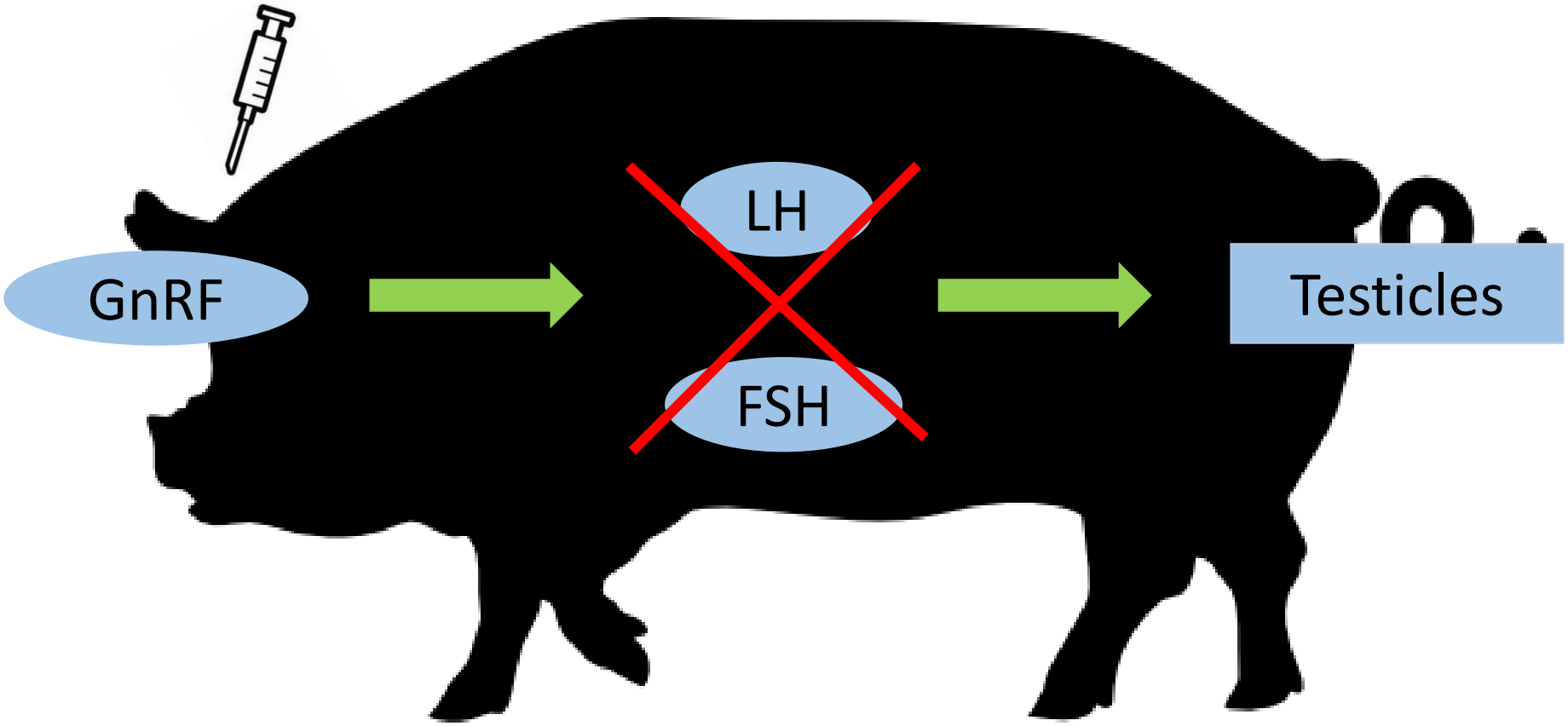
Castration

Alternatives

- ~~Sexing of semen for breeding females~~
- ~~Genetic selection against boar taint~~
- ~~Breeding entire males~~
- Immunocastration

Introduction

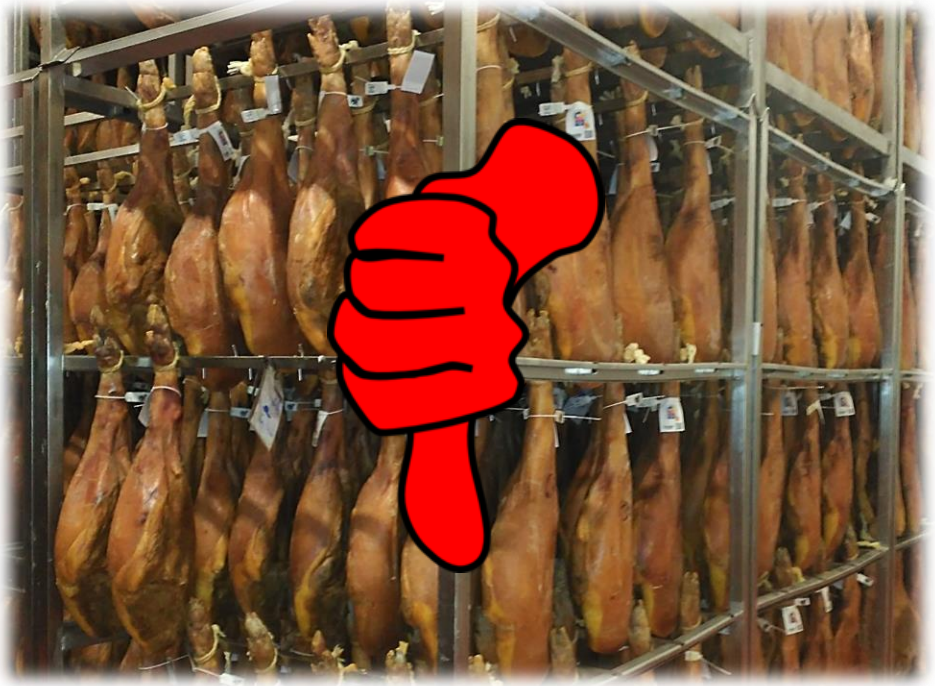
Immunocastration



Introduction

Level of fat deposition (Batorek *et al.*, 2012):

Immunocastrated < Surgical castrated



Feeding

- ↑Energy

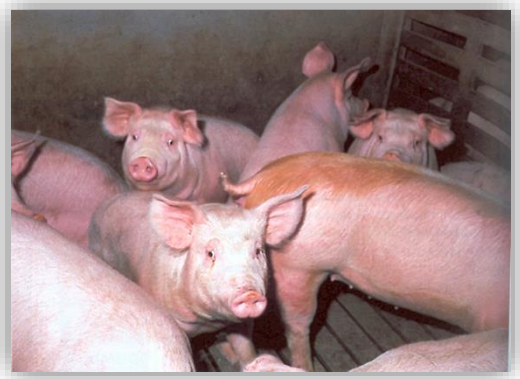
(Suárez-Belloch *et al.*, 2013)

- ↓Protein

(Suárez-Belloch *et al.*, 2016)

Objective

Assess the impact of the type of castration and different diets on meat and fat quality of male pigs intended for Teruel ham.



Material and methods

90 DU x (LD x LW) male pigs of 35.3 ± 4.10 kg

Birth

Immunocastration

Growing (80-109 kg)

Slaughter

Surgical castration: 1st dose (21 kg) 2nd dose (80 kg)

Finishing (109-137 kg)

Material and methods

	DIET		
	A	B	C
Growing (80-109 kg)			
Net energy, kcal/kg	2,330	2,480	2,330
Crude protein, %	16.0	16.0	14.0
Lysine SID, %	0.77	0.77	0.67
Finishing (109-137 kg)			
Net energy, kcal/kg	2,330	2,480	2,330
Crude protein, %	14.5	14.5	12.5
Lysine SID, %	0.63	0.63	0.54

Material and methods

Slaughter weight: 137 kg

Ham

- Moisture
- Protein
- Intramuscular fat

Loin

- Colour
- WHC
- WB shear force

Subcutaneous fat

- Fatty acid profile

Material and methods

Statistical analysis

-Factorial design (2 types of castration x 3 diets).
-GLM procedure of SAS.
-Main effects: type of castration and diet.
-Interaction.
-Experimental unit: animal.

Results

Impact of the type of castration on meat quality

	Type of castration		SEM (n=45)	*P*-value
	Surgical	Immune		
Chemical composition, %				
Moisture	**71.6**	**72.2**	0.16	0.008
Protein	23.1	23.1	0.09	NS
Intramuscular fat	**4.19**	**3.33**	0.203	0.003

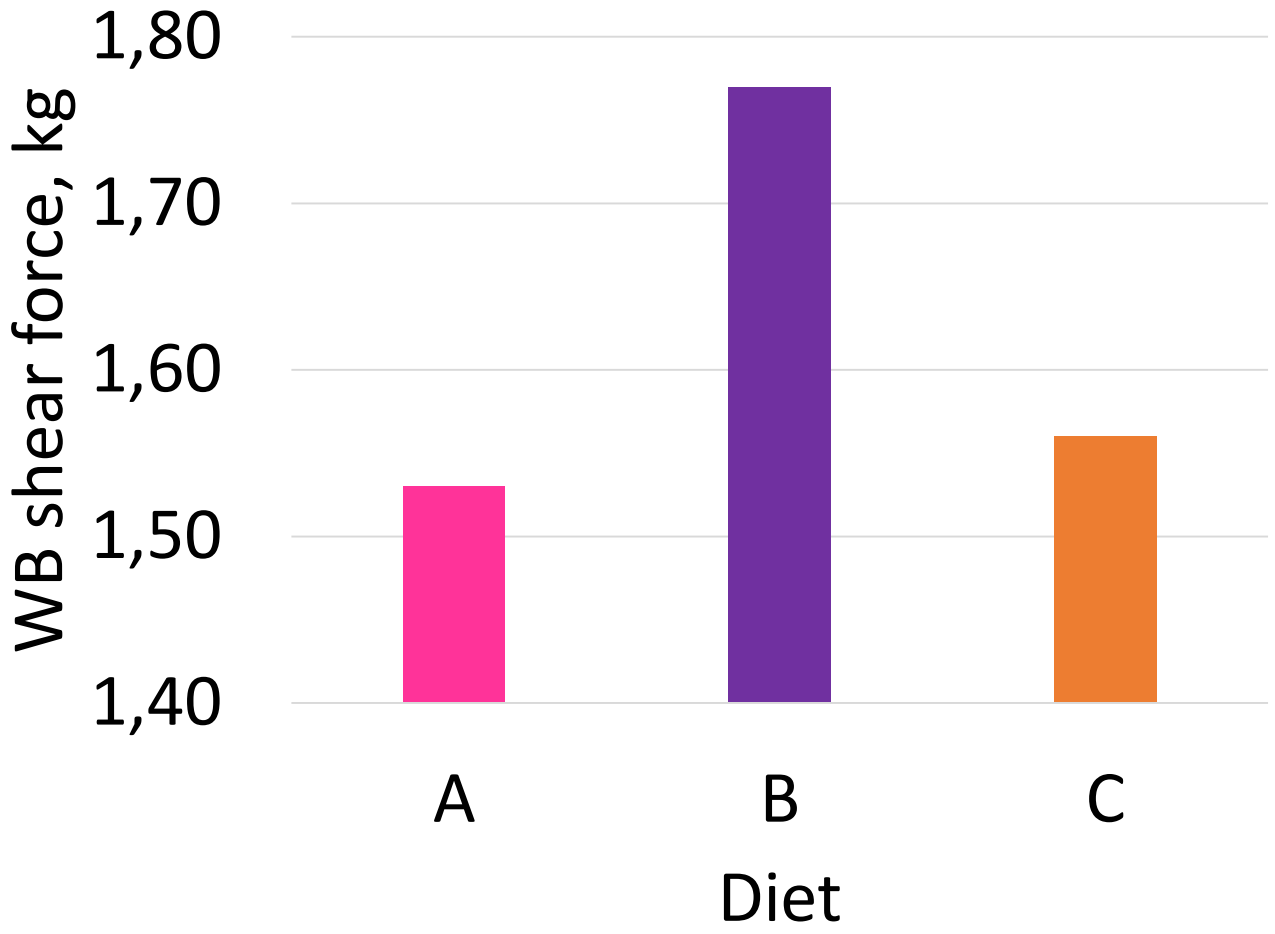
Results

Impact of the type of castration on meat quality

	Type of castration		SEM (n=45)	*P*-value
	Surgical	Immune		
Colour traits				
Lightness, *L**	**34.9**	**32.1**	0.82	0.020
Redness, *a**	3.81	4.37	0.301	NS
Yellowness, *b**	14.8	14.1	0.33	NS
Hue angle, *H°*	**75.6**	**72.5**	1.22	0.079
Chroma, *C**	15.4	14.9	0.31	NS

Results

Impact of the diet on meat quality

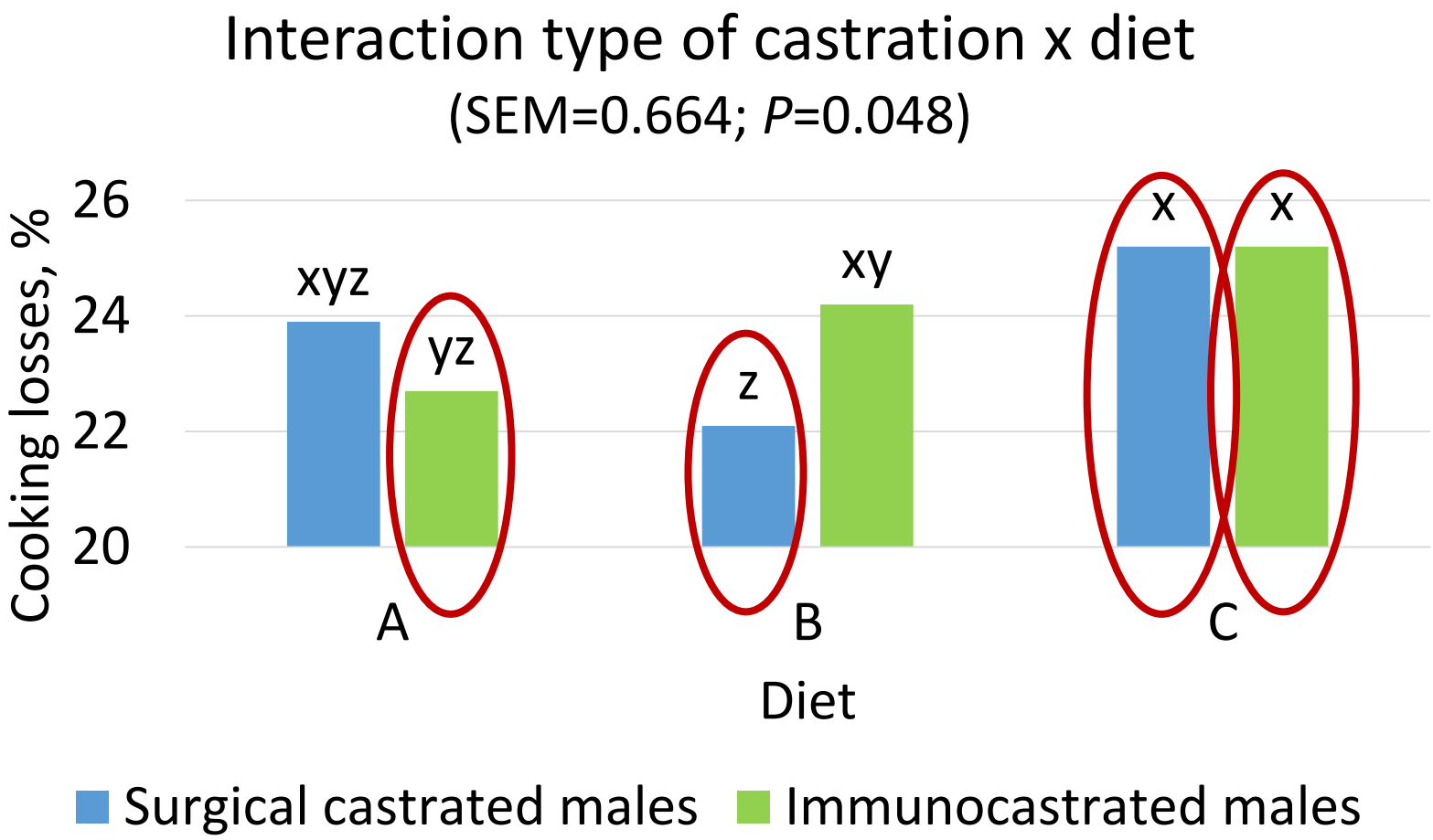


SEM= 0.079

P= 0.069

Results

Meat quality



Results

Effect of the type of castration on fat quality

	Type of castration		SEM (n=24)	*P*-value
	Surgical	Immune		
C18:1n-9	42.4	41.7	0.23	0.042
C18:4n-3	0.047	0.037	0.0033	0.038
Total monounsaturated fatty acids	47.3	46.5	0.24	0.028

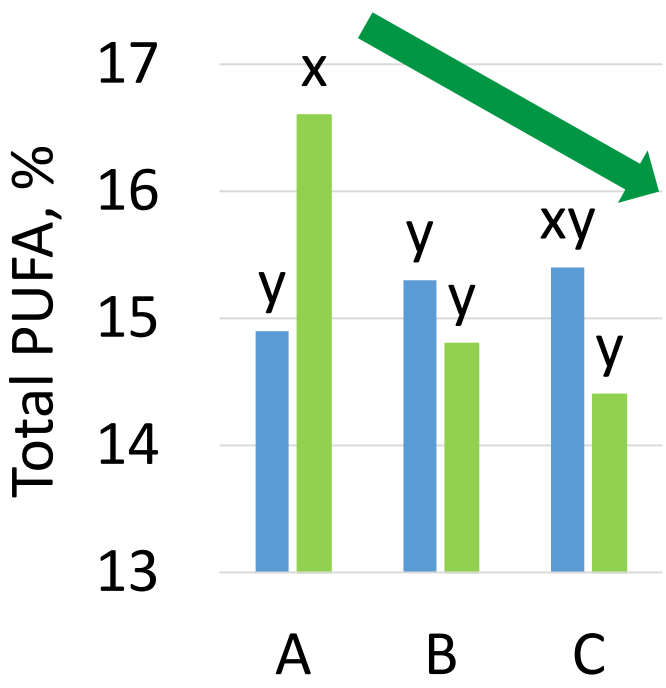
Results

Effect of the diet on fat quality

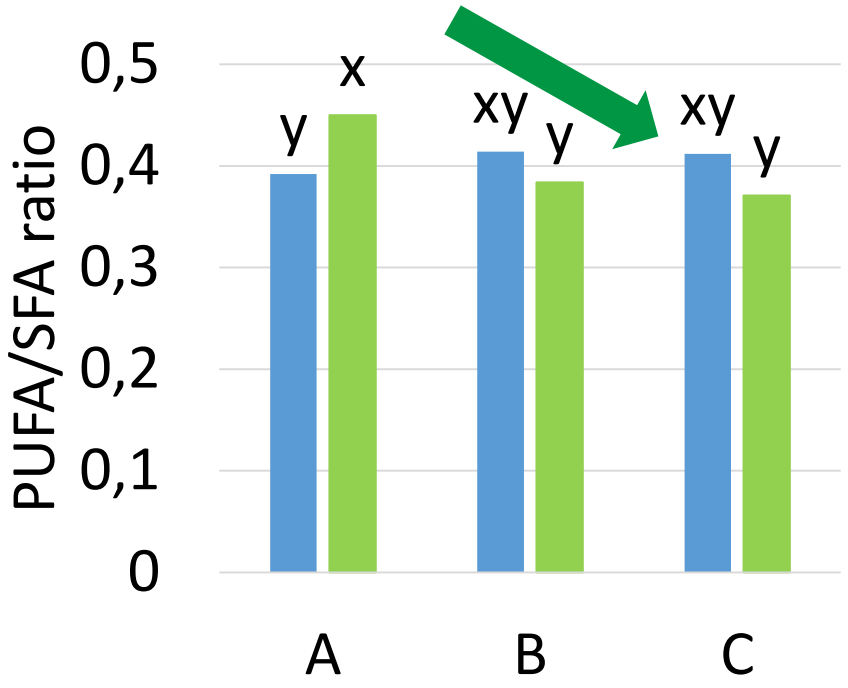
	Diet			SEM (n=16)	*P*-value
	A	B	C		
C15:0	0.054^{x}	0.051^{x}	0.042^{y}	0.0024	0.003
C15:1	0.008^{x}	0.008^{x}	0.007^{y}	0.0004	0.023
C17:0	0.334^{x}	0.286^{y}	0.271^{y}	0.0139	0.009
C17:1	0.302^{x}	0.235^{y}	0.232^{y}	0.0115	<0.0001
C18:1n-7	1.76^{x}	1.59^{y}	1.79^{x}	0.055	0.020
C18:3n-3	0.698^{x}	0.645^{y}	0.632^{y}	0.0154	0.010

Results

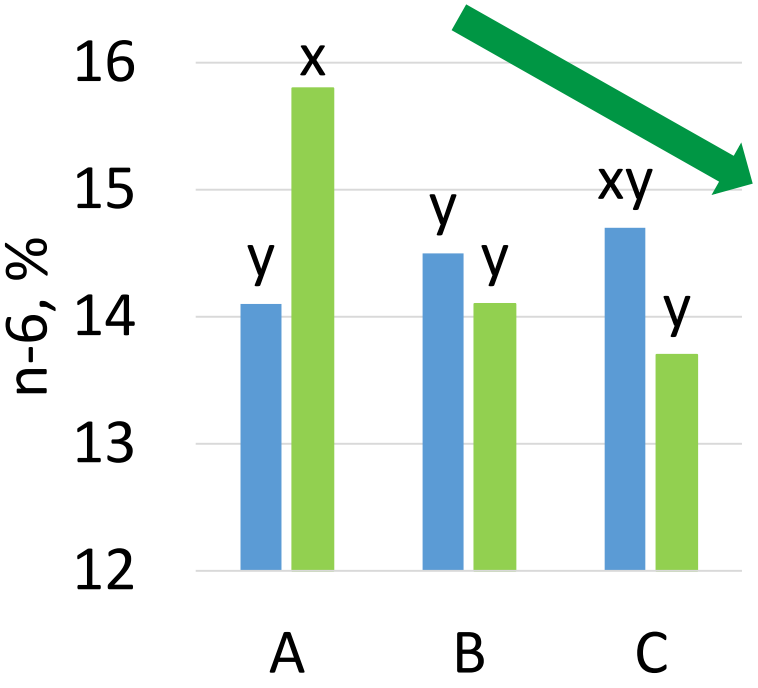
Fat quality interactions



SEM=0.47; *P*=0.012



SEM=0.0177; *P*=0.016

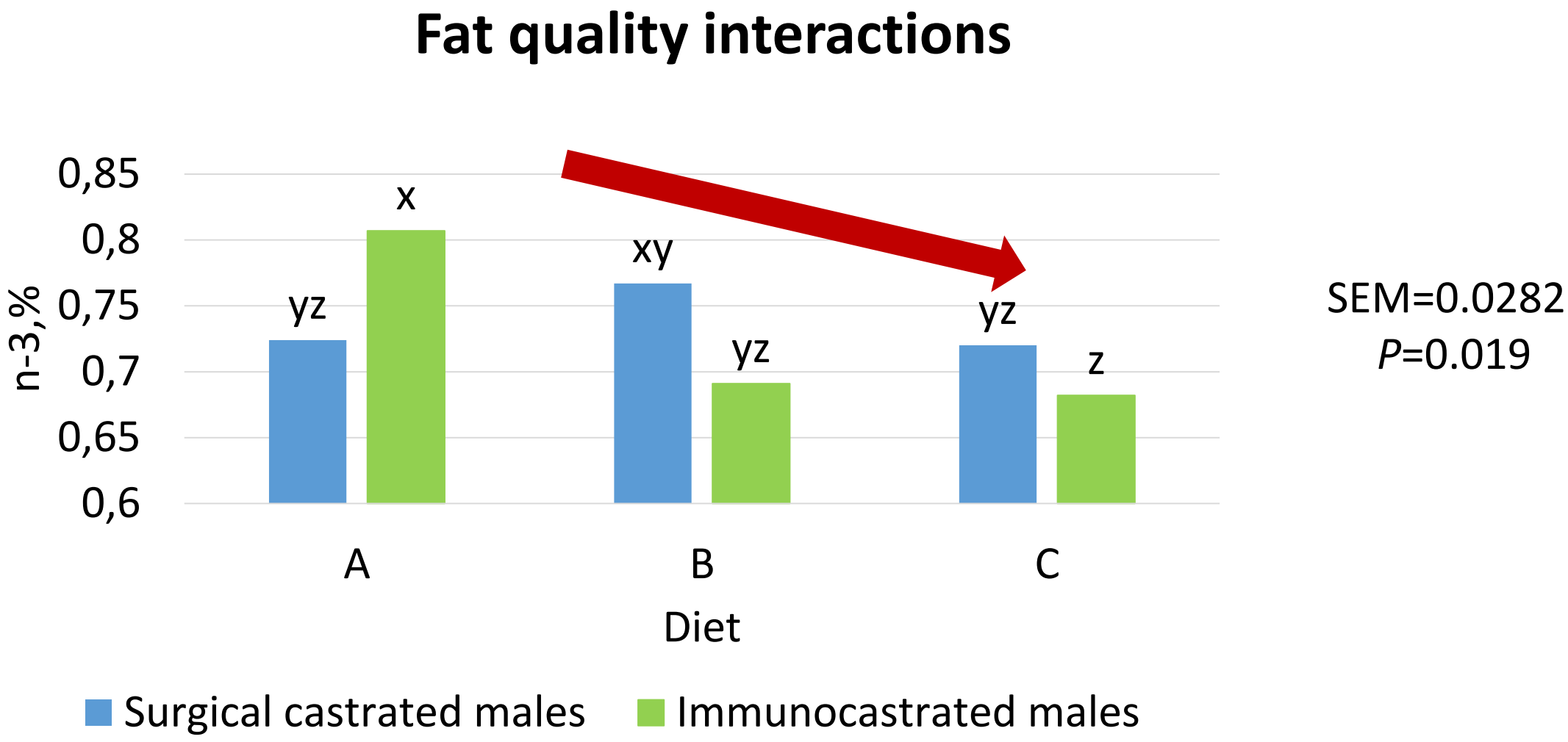


SEM=0.45; *P*=0.011

Surgical castrated males

Immunocastrated males

Results



SEM=0.0282
P=0.019

Conclusions

- **Immunocastration of male pigs** provides meat with **lower intramuscular fat content** and **less monounsaturated fat** than surgical castration.

- The **diet had scarce effect on pork quality** but, **in** the case of **immunocastrated male pigs**, **high energy levels or low lysine content could affect** the fat quality and, in consequence, **the quality of the end product.**

Thank you for your attention!

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