Comparative proteomic profiling of two muscles from five divergent pig breeds using SELDI-TOF proteomics technology

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INTRODUCTION

1. SELDI-TOF increases understanding of the role of proteins expression in pig meat quality.

2. There is a lack of biomarkers to screen for divergent pig breeds and muscle types

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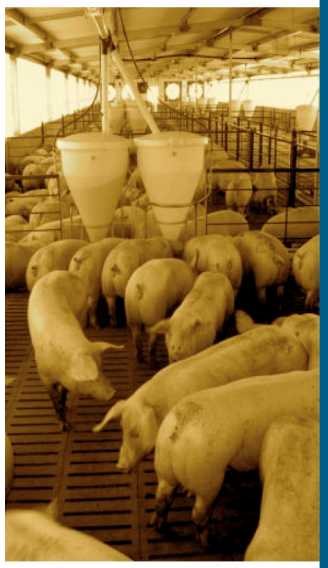
OBJECTIVE



The specific objective of the present study was:

To identify biomarkers and to evaluate the influence of different breed types and muscle type on the expression of muscle proteins, as well as their interactions, using SELDI-TOF-MS techniques

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MATERIALS AND METHODS

126 pig males subjected to a 2 x 5 factorial design

(2 muscles x 5 pure and divergent breeds)

- Longissimus dorsi (LD)
- Semimembranosus (SM)

- 43 Landrace
- 21 Duroc
- 43 Large White
- 13 Pietrain
- 6 Belgium Landrace

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MATERIALS AND METHODS

--Protein expression----------

Isolation of water soluble fraction proteins

SELDI-TOF analysis

--Statistic model ----------

$$Y_{ijlmno} = \mu + A_i + B_j + M_h + (B \times M)_{jk} + \varepsilon_{ijh}$$

A= pig; B= Breed type; M= Muscle type

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RESULTS AND DISCUSSION

✓The number of peaks per spectra (36.33 ± 0.87) was not affected by breed and muscle type.

✓ The intensity of peaks was strongly affected by breed, muscle type, as well as the interaction between them.

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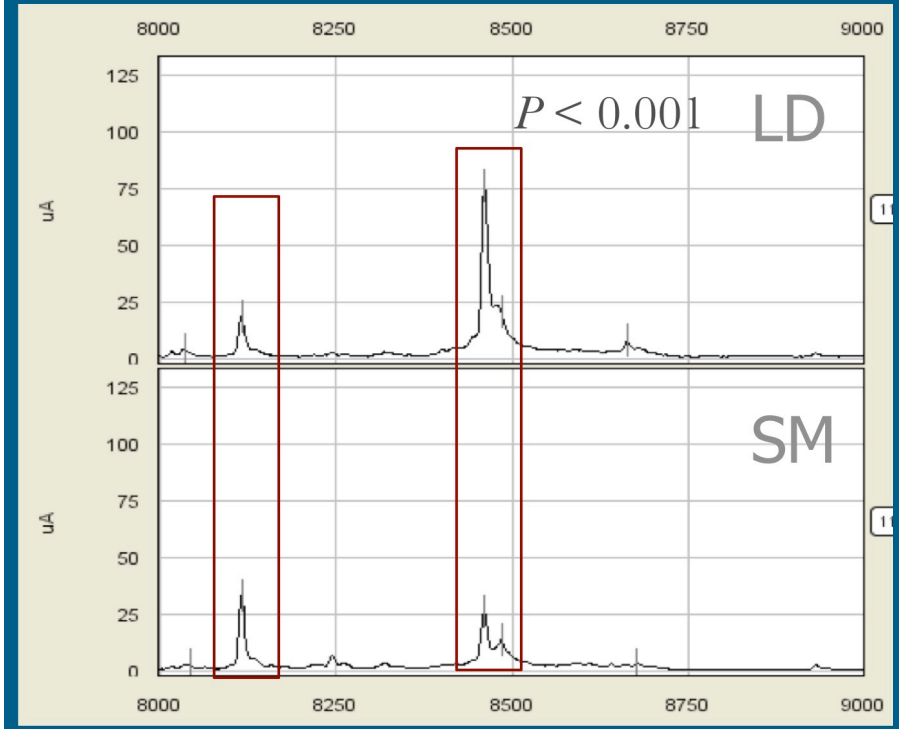
Muscle biomarkers intensity (μA)



Peak, *m/z*	LD (μA)	SM (μA)	SEM	*P*-Value
8,126	9.0	21.1	0.08	0.001
8,485	48.7	12.4	2.43	0.001
14,847	2.6	1.8	0.11	0.001

LD= *Longissimus dorsi* muscle

SM= *Semimembranosus* muscle

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Breed biomarkers intensity (μA)

Peak (*m/z*)	DU	BL	LS	LW	PI	SEM	*P*-value
5,773	8.3	5.2	12.9	8.7	5.5	1.95	0.001
7,114	2.8	4.6	4.2	4.0	4.2	0.17	0.001

DU= duroc; BL = Belgian Landrace; LS= Landrace; LW= Large White; PI= Pietrain

Breed and muscle biomarkers intensity (μA)

	Longissimus dorsi					*Semimembranosus*						
Peak *m/z*	DU	BL	LS	LW	PI	DU	BL	LS	LW	PI	SEM	P-value
3,098	2.0	1.6	2.9	1.6	1.2	10.3	0.4	5.8	8.4	4.2	0.76	0.001
8,043	5.4	4.9	4.7	4.0	7.4	2.4	7.9	3.3	3.1	3.6	0.35	0.001

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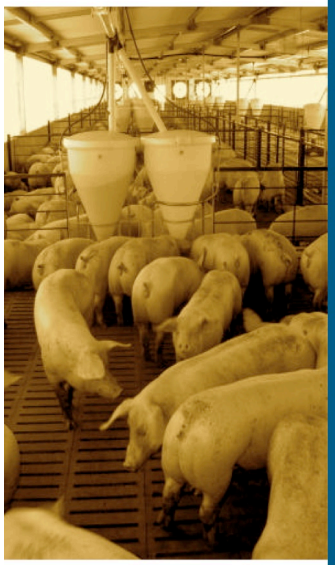
CONCLUSION



A total of 3 biomarkers to discriminate muscle type (the 8,126; 8,485 and 14,847 *m/z*), 2 to categorize breed types (5,773 and 7,114 *m/z* peaks), and 2 to classify breed type according muscle type (3,098 and 8,043 *m/z* peaks) were identified.

SELDI-TOF-MS is a highly efficient method for the identification of biomarkers and changes in muscle protein expression for divergent pure pig breeds and muscle type.

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OBJECTIVE

Acknowledgement

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Thank you

Questions

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