

# Effects of Rearing System and Carcass Characteristics on Cooking Losses in Pork

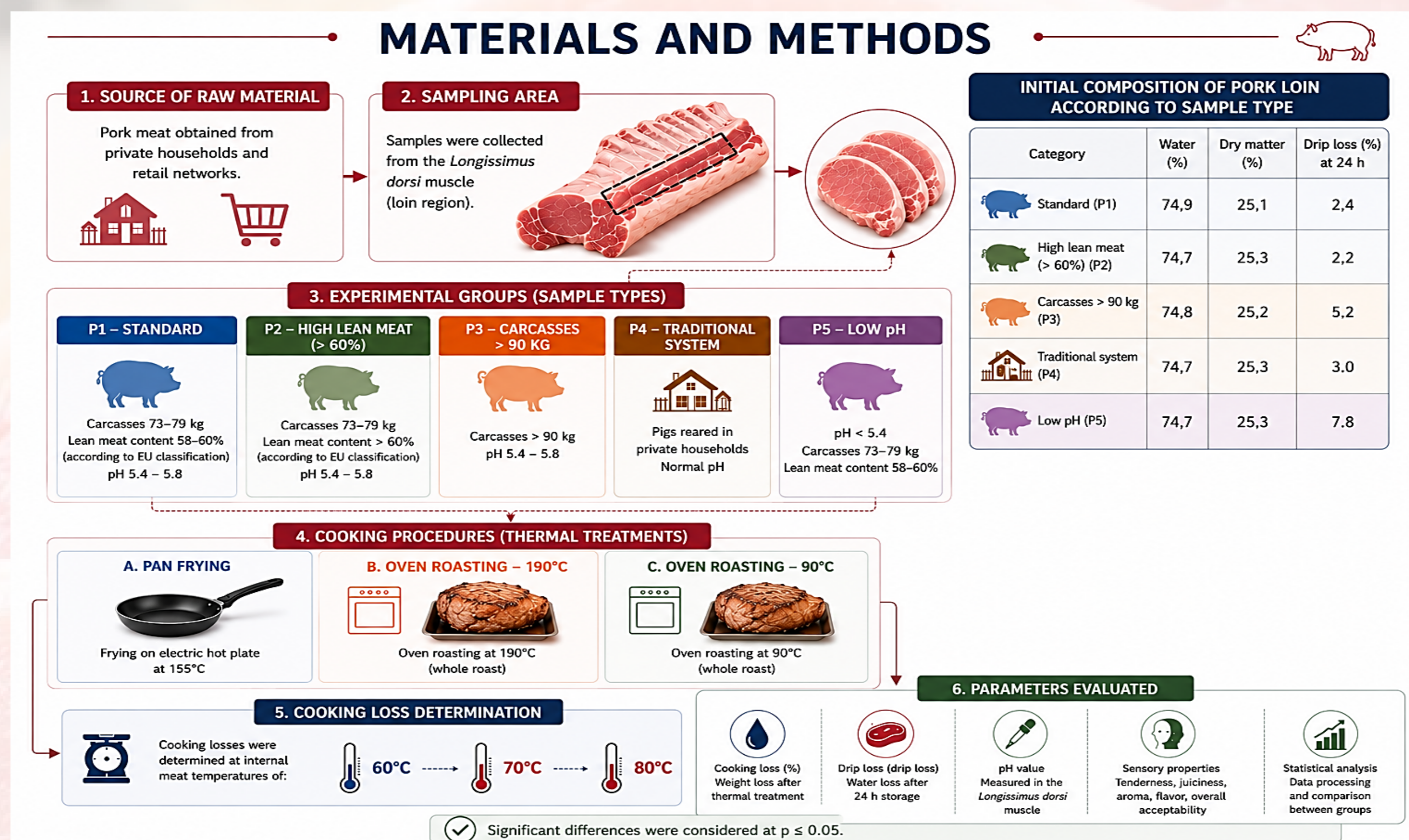
Adela Marcu, Diana Ioana Marcu, Lavinia Ștef, Gabi Dumitrescu,  
 Marioara Nicula-Neagu, Ioan Peț, Doru Dronca, Igori Balta

Faculty of Bioengineering of Animal Resources, University of Life Sciences "King Mihai I" from Timisoara,  
 Calea Aradului, No.119, 300645, Timisoara, Romania  
 E-mail: adelamarcu@usvt.ro

**Abstract:** The study evaluated the influence of meat quality, carcass weight, and rearing system on cooking losses and sensory properties of pork meat. The research was conducted on the *Longissimus dorsi* muscle collected from five carcass categories differentiated by lean meat percentage, carcass weight, pH value, and rearing system. Significant differences were observed in drip and cooking losses among the experimental groups. Samples from traditional rearing systems showed better water-holding capacity and lower cooking losses, while meat from heavy carcasses and low-pH samples presented higher losses. Increasing thermal treatment intensity led to higher cooking losses and reduced juiciness. The results highlight the important role of carcass characteristics and rearing system in determining pork meat quality and technological performance.

## Introduction

Consumer satisfaction with pork meat is strongly influenced by tenderness, which represents one of the main quality attributes of meat products. Although post-mortem tenderization occurs more rapidly in pork than in beef, considerable variability in meat tenderness still exists depending on the rearing system, slaughter conditions, muscle type, and carcass characteristics. In addition, thermal processing conditions may significantly affect cooking losses and the sensory properties of the final product.



Category	Water (%)	Dry matter (%)	Drip loss (%) at 24 h
Standard (P1)	74,9	25,1	2,4
High lean meat (> 60%) (P2)	74,7	25,3	2,2
Carcasses > 90 kg (P3)	74,8	25,2	5,2
Traditional system (P4)	74,7	25,3	3,0
Low pH (P5)	74,7	25,3	7,8

## Results and discussion

**COOKING LOSSES (%) AT INTERNAL TEMPERATURES OF 60°C, 70°C AND 80°C ACCORDING TO COOKING METHOD**

Type of meat	60°C (internal temperature)			70°C (internal temperature)			80°C (internal temperature)		
	190°C (oven)	90°C (oven)	Pan (frying)	190°C (oven)	90°C (oven)	Pan (frying)	190°C (oven)	90°C (oven)	Pan (frying)
P1 Standard	16,80%	8,95%	9,60%	26,60%	22,40%	17,95%	32,65%	31,80%	29,60%
P2 Carcass >65%	19,40%	15,80%	12,90%	26,00%	24,35%	21,20%	32,00%	34,20%	35,00%
P3 Carcass >90 kg	23,80%	12,65%	14,20%	31,50%	26,12%	22,65%	32,50%	33,80%	33,65%
P4 Traditional system	17,50%	7,80%	7,20%	25,25%	22,05%	16,22%	31,15%	31,90%	28,80%
P5 Low pH	22,40%	17,10%	12,70%	27,05%	27,00%	22,00%	34,00%	33,20%	31,00%

The results indicate that cooking losses increased progressively with higher internal temperatures, regardless of the cooking method applied. Roasting at 190°C produced the highest losses, while low-temperature roasting (90°C) and pan frying better preserved meat juiciness.

Differences among meat categories were also observed. Meat from heavy carcasses and low-pH samples showed higher losses during thermal processing, whereas samples from the traditional rearing system demonstrated improved stability and reduced moisture loss.

These variations suggest that carcass characteristics and meat quality parameters influence the thermal behavior of pork and should be considered when selecting optimal cooking conditions.

## CONCLUSIONS

Final internal temperature was the main factor influencing cooking losses. Higher internal temperatures resulted in increased weight loss due to water evaporation and muscle protein contraction.

Cooking method significantly affected cooking losses. Moderate thermal treatments (90°C) and pan frying produced lower losses compared to oven roasting at 190°C, contributing to better juiciness and meat quality.

Meat composition and carcass characteristics influenced thermal behavior during cooking. Meat from heavy carcasses (>90 kg), low-pH samples, and carcasses with high lean meat content (>65%) showed higher cooking losses and lower water-holding capacity.

Meat obtained from the traditional rearing system presented the lowest cooking losses, suggesting superior technological and sensory quality.