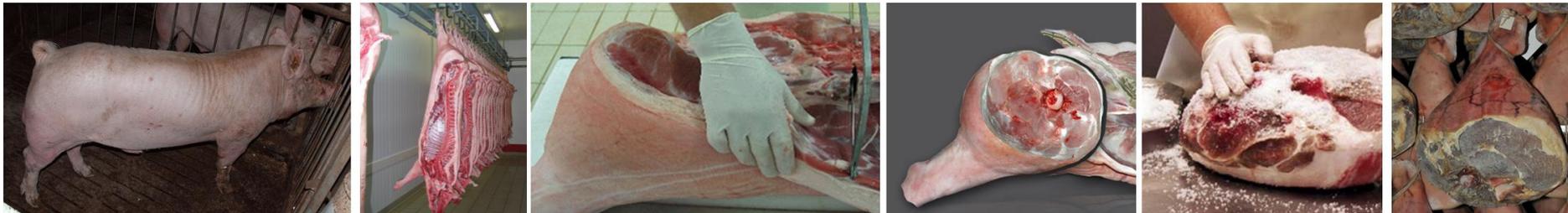


Impact of raw material from EM: Dry-cured product quality

Martin Škrlep (Agricultural Institute of Slovenia)

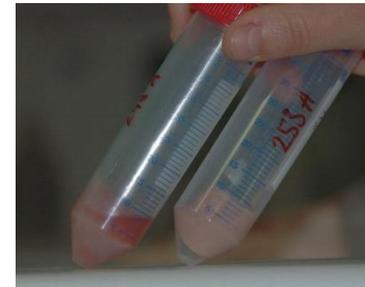
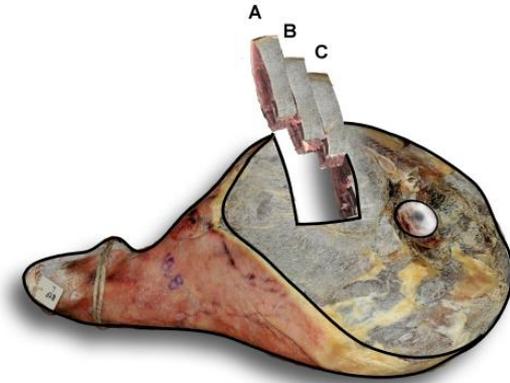


Dry-cured ham

- Integral meat part ← endogenous enzymes
- Lengthy maturation ← intensive physico-chemical changes
- Often no smoking or spices, just salt ← no flavour masking



High quality raw material is essential (absence of skin defects, good technological quality of meat and fat)



Raw material → final product

Meat quality in EM (?)

- Low WHC (?)
- Low fatness (subcutaneous , IMF)
- Lower tenderness (fresh meat)
- Higher proteolytic potential (?)
- Boar taint occurrence (~level, A/S)



Consequences for dry-cured ham (?)

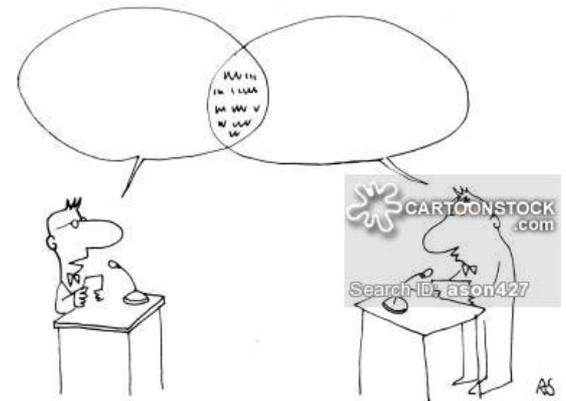
- Degree of desiccation (? ↑)
- Degree of salt uptake (? ↑)
- Influences on proteolysis (↓, ↑)
- Inferior sensory quality (? ↓, ← boar taint, proteolysis, oxidation)

Rare available studies on EM hams

- Diestre et al. (1990) AnimProd, 50(1990): 519-530
- Bañon et al. (2003), MeatSci, 63:381-388
- Bañon et al. (2003), MeatSci, 65:1031-1037
- Font i Furnols (2013), EAAP WG on Production and Utilisation of Meat form Entire Male Pigs, Monells.

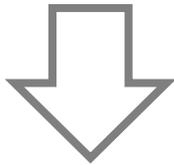


Mainly sensory studies = WP6



EM vs. FE & SC

- Dry-cured hams aged for 7 months
- A=1.18 μ g/g, S=0.08 μ g/g



- Lower yield (3.3 and 2.2 %-points for EM vs. SC and EM vs. FE)
- Only slightly \uparrow PUFA (EM vs. SC)
- No sensory differences (appearance, smell, taste) even at A>1.5 μ g/g
- No significant boar taint reduction during dry-curing

Acceptabilité par le consommateur du jambon sec de mâles entiers

Rendement de séchage, qualité des gras et composés odorants du jambon sec de mâles entiers

Mots-clés : Mâles entiers, Jambon sec, Acceptabilité par le consommateur

Auteur : Patrick Chevillon¹, Pierre Le Strat², Jean Luc Vendevre², Eric Gault¹, Thierry Lhommeau¹, Michel Bonneau¹, Jacques Mourot³



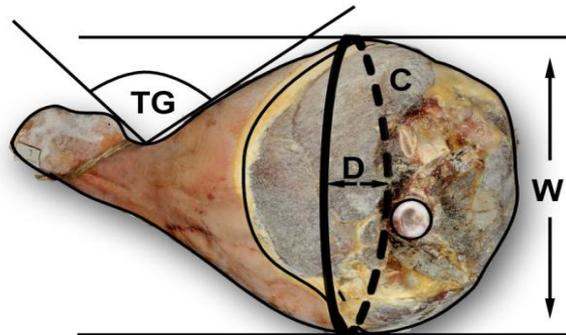
Comparison of EM and IC

- EM and IC reared under the same conditions
- 15 months of processing
- Raw material, yields, chemical composition, texture, sensory traits, volatile profile



Entire male hams:

- Heavier hams with better conformation (circumference, depth)
- Higher processing loss (3.4% lower yield)



Comparison of entire male and immunocastrated pigs for dry-cured ham production under two salting regimes

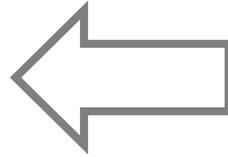


Martin Škrlep^a, Marjeta Čandek-Potokar^{a,*}, Nina Batorek Lukač^a, Maja Prevolnik Povše^b, Carolina Pugliese^c, Etienne Labussière^d, Mónica Flores^e

Comparison of EM and IC

Entire male hams:

- Darker (L^*), less yellow (b^* , hue angle) colour
- Saltier, less fatty (IMF) and slightly drier ham + slightly lower PI and aw



Lower IMF, higher DM, ? oxidation

Higher level of water loss/salt uptake



Comparison of EM and IC

Entire male hams:

Rheology

- Higher gumminess, hardness

Sensory traits

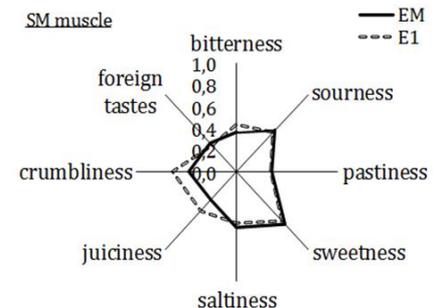
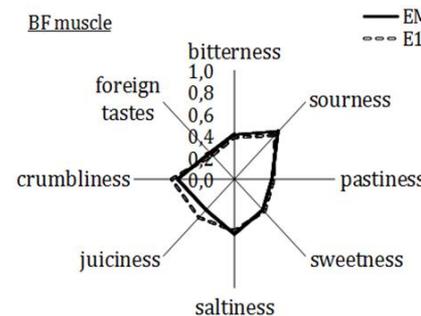
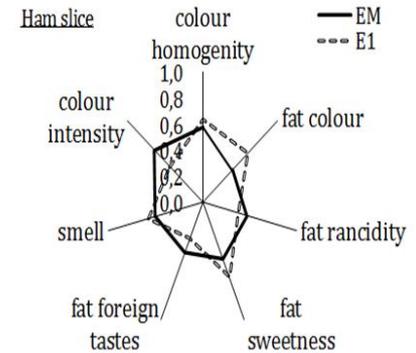
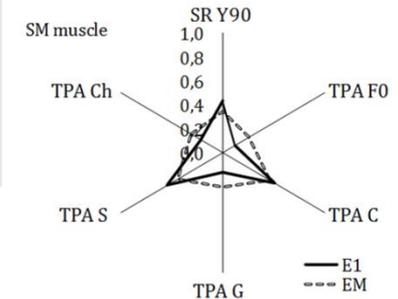
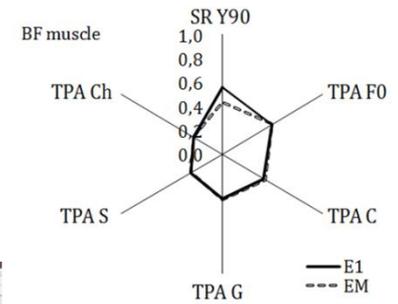
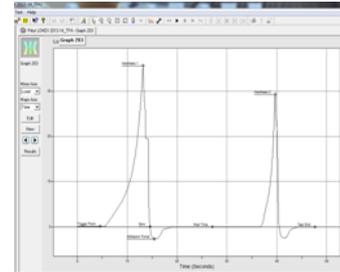
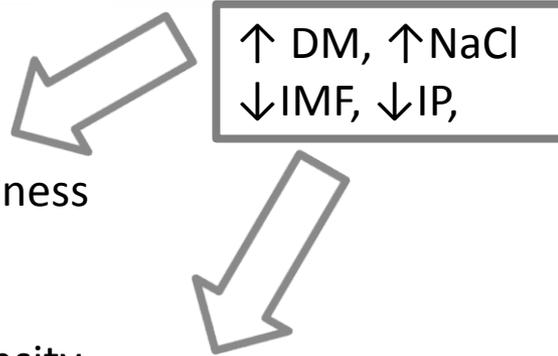
- Higher meat colour intensity
- Lower marbling, sweetness, juiciness, solubility

Boar taint perception

- No sign. differences (EM vs. IC), but...
- ... still there is a boar taint issue as...
- ... off-flavour perception was positively correlated with A and S content

Volatile profile

- Negligible effect of sex category



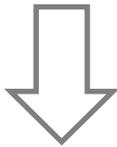
Reduction of boar taint during dry-curing

Sampling subcutaneous fat **before** and **after** processing
→ app. **30% reduction** after 15 months of maturation

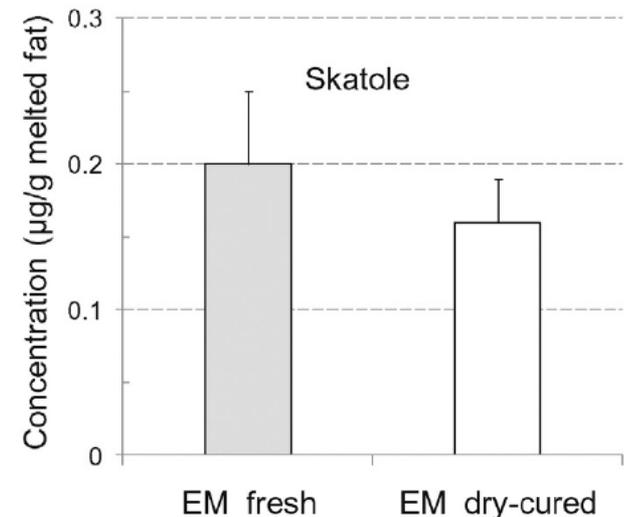
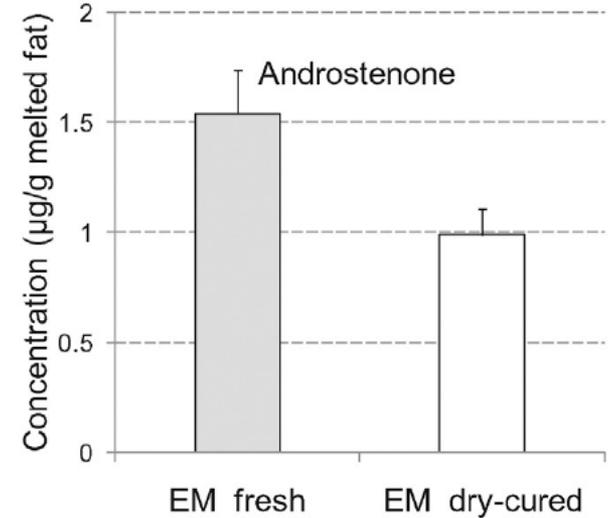


? reasons (A, S = relatively stabile compounds),

- A, S are volatile substances
- Drip loss (some water solubility of S)
- Sampling position (? variability inside the carcass)



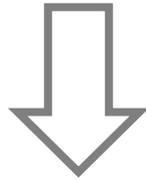
Further investigations needed



Extension of the study

EFFECTS OF SALTING DURATION AND BOAR TAIN T LEVEL ON QUALITY OF DRY-CURED HAMS

Comparison of hams according to boar taint level



Tadej KALTNEKAR ^{1,2}, Martin ŠKRLEP ³, Nina BATOREK LUKAČ ³, Urška TOMAŽIN ³, Maja PREVOLNIK POVŠE ^{3,4}, Etienne LABUSSIÈRE ⁵, Lea DEMŠAR ⁶, Marjeta ČANDEK-POTOKAR ^{3,4,7}

Classification of low boar taint (LBT) and high boar taint group (HBT)

LBT < 0,78 µg/g < HBT

Mediane of androstenone concentration in subcutaneous fat of dry-cured ham

Threshold for sensorial perception is 0,5-1,0 µg/g fat (Walstra et al., 1999)

Comparison of dry-cured hams according to boar taint level (HBT vs. LBT)

No differences in raw material properties (weight, pH, fat)

Chemical traits (higher proteolysis in HBT)

- 11% higher BF proteolysis index (*)

Dry ham texture (HBT softer than LBT)

- 40% higher SM and BF adhesiveness (**, +)
- 24% lower BF hardness (+)
- 23% lower BF cohesiveness (*)
- 40% lower BF gumminess (*)
- 46% lower BF chewiness (*)

Sensory traits (lower overall sensory “likeness” in HBT)

Higher degree of off taste/flavour (*, **)

Higher degree of pastiness (>50%, *)

Higher degree of bitterness, solubility (*)



"Rats! It's already tenderized."

Higer boar taint level may be asociated with higer proteolytic activity.

Comparison of dry-cured hams according to boar taint level (HBT vs. LBT)

Interacting effect of salting an boar taint on off-flavours:

High – Low salt = 40%

	High Salt		Low Salt		P-value			RMSE
	LBT	HBT	LBT	HBT	Salting	Boar taint	Salting × Boar taint	
Off-flavour								
BF	0,8 ^a	1,0 ^a	1,3 ^a	2,5 ^b	0,0001	0,002	0,014	0,3
SM	0,6 ^a	0,8 ^a	1,2 ^a	2,1 ^b	0,001	0,006	<u>0,071</u>	0,3
fat	0,9	1,1	1,0	1,6	0,254	<u>0,081</u>	0,330	0,4

Higher off-flavour perception in combination LS x HBT.

? Salt masking the boar taint to some degree

?! Increased proteolysis due to lower salt and higher proteolytic potential of HBT resulting in higher off—flavour generation

Knowledge gaps/further investigation

...