



University «A. Moro»
of Bari - Italy



Department of
Veterinary Medicine

Volatile compounds profile of donkey meat during aging

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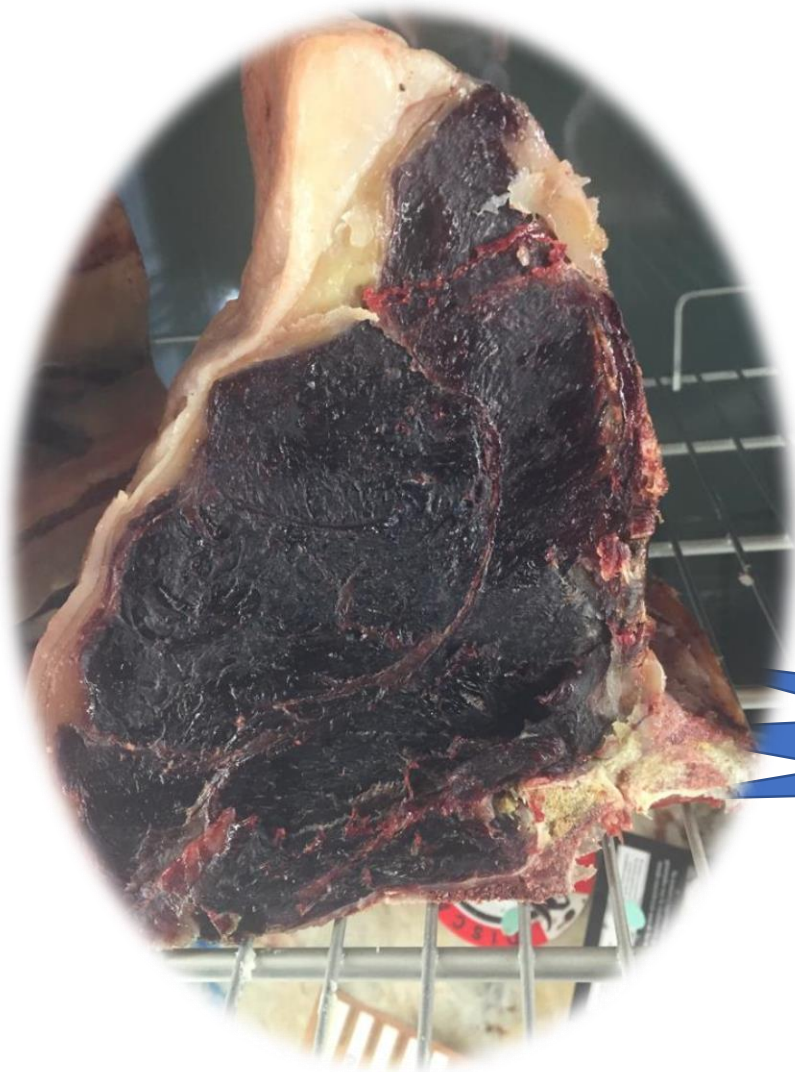
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consumer choice is affected by...



color

tenderness

juiciness

flavor

aroma compounds

Why donkey...



characteristics

low fat

UFA/SFA

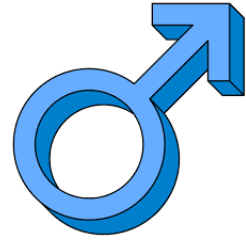
biodiversity

How

10 donkeys



Same sex



Same breed

Martina Franca

Same ration



Same farm



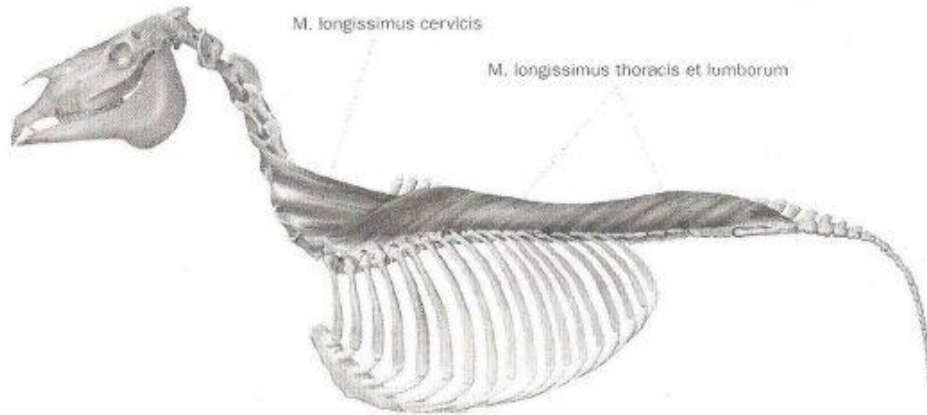
Same age

1 year old

Sampling



Longissimus Dorsi



Divided, vacuum packed,
and stored at 4°C.

randomly assigned to each ageing time

1

3

6

9

14

days

Stored -80°C and shipped in dry ice



SAMPLES AND ODOR ANALYZE



Slices were cooked by grilling at 130–150 °C/5 min on each surface

Heating treatment was considered complete when all the slices reached an internal temperature of 70 °C

Minced samples were analyzed to determine possible differences in odor after cooking

How can changes in odor be detected?

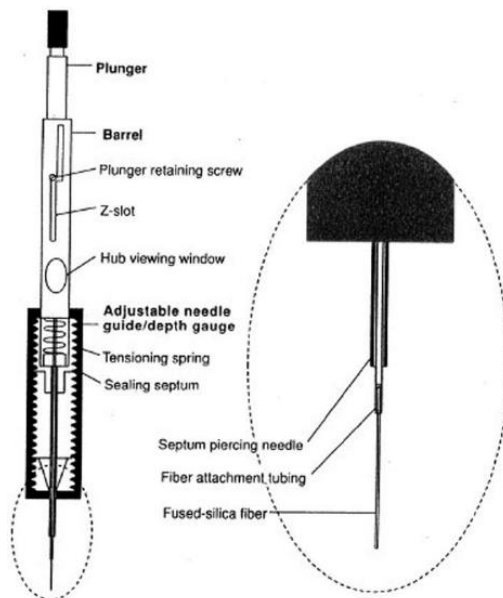
Biochemical changes experimented by samples due to:

- LIPID OXIDATION REACTIONS
- PROTEIN OXIDATION REACTIONS
- REACTIONS DERIVED FROM MICROBIOLOGIC ACTIVITY

Lead to

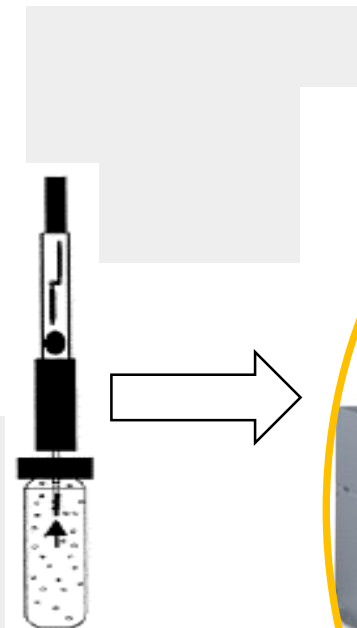
Volatile compound formation

VOLATILE COMPOUNDS EXTRACTION



*Solid Phase Micro Extraction
(DVB/CAR/PDMS)*

After fiber balance for 15 min, 1 g of sample was put into 20 mL vial



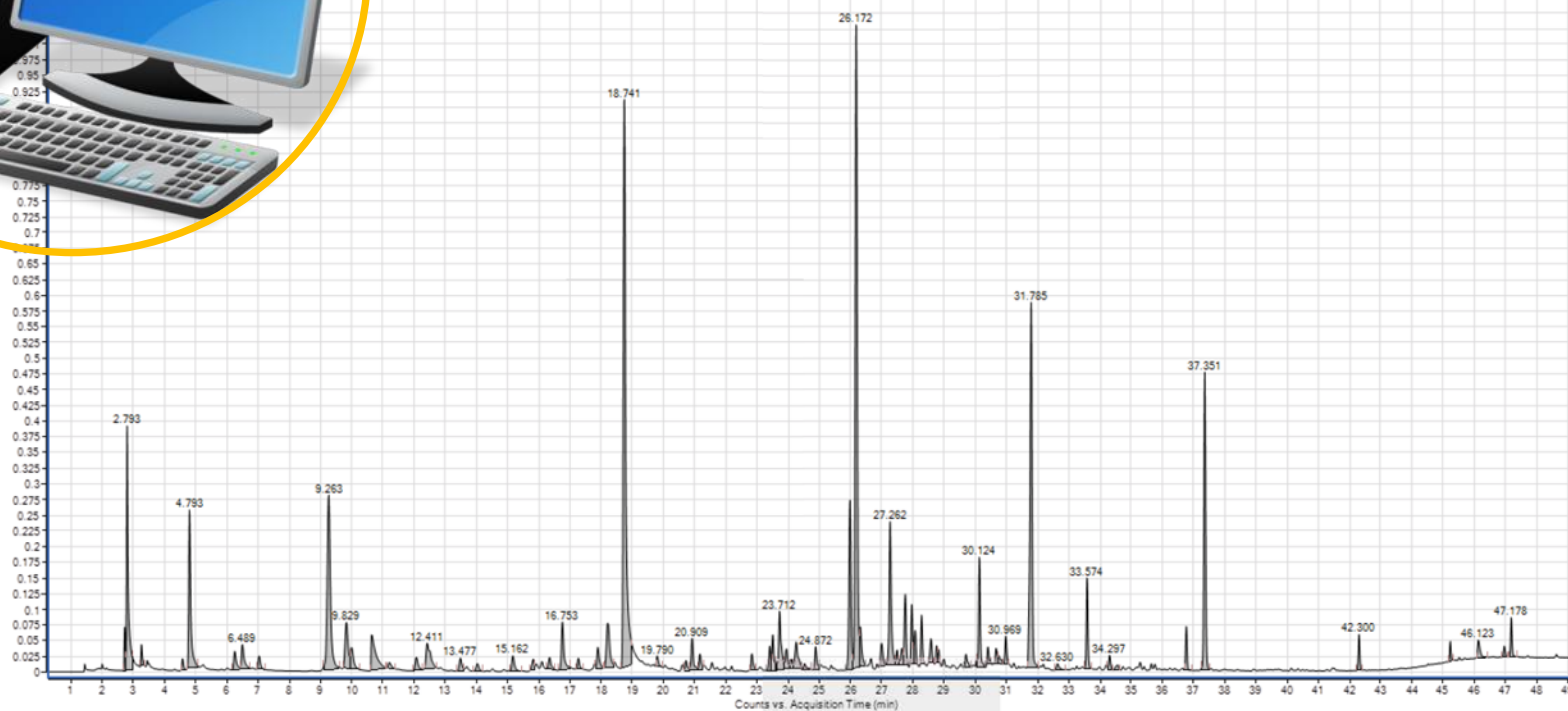
Volatile compounds absorption from the headspace (35°C, 30 min)

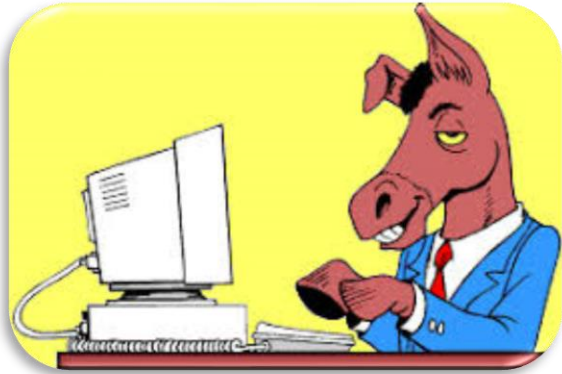


Volatile compounds desorption into the injection port of the GC-MS (260°C, 8 min)



Mass spectrums were compared to NIST14 base data or their linear retention index was contrasted to bibliography





analysis of variance (SAS, 2011)

$$y_{ij} = \mu + A_i + \varepsilon_{ij},$$

Statistical model included as fixed effect ageing time and random residual error.

significant effect ($P < 0.05$)

Tukey's test

Results

119 total different VOCs

Hydrocarbons

50

Ethers

1

Sulfur compounds

2

Aldehydes

18

Carboxylic acids

3

VOCs

Nitrogen compounds

5

Ketones

16

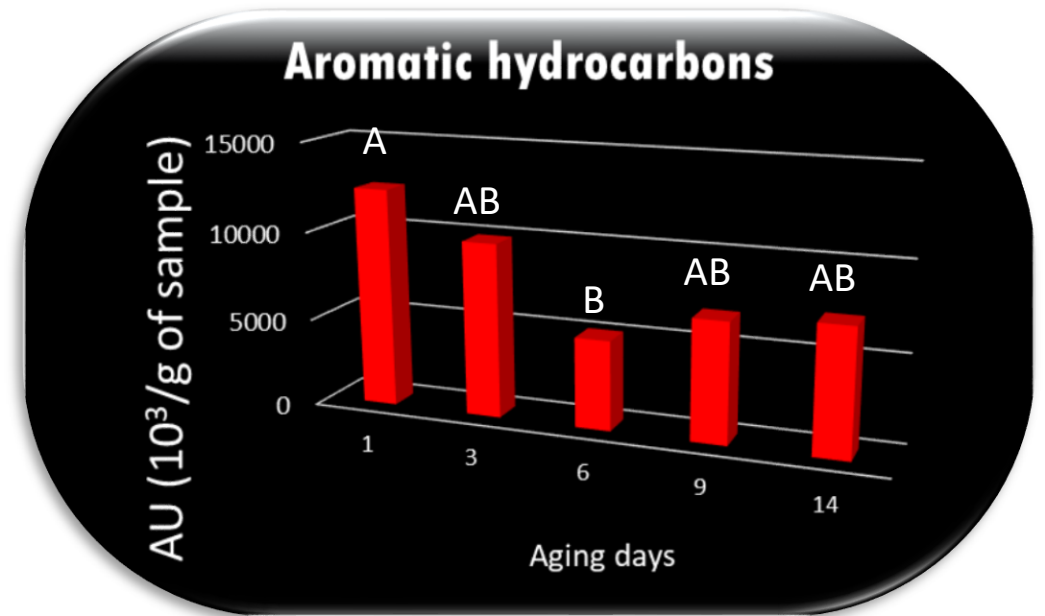
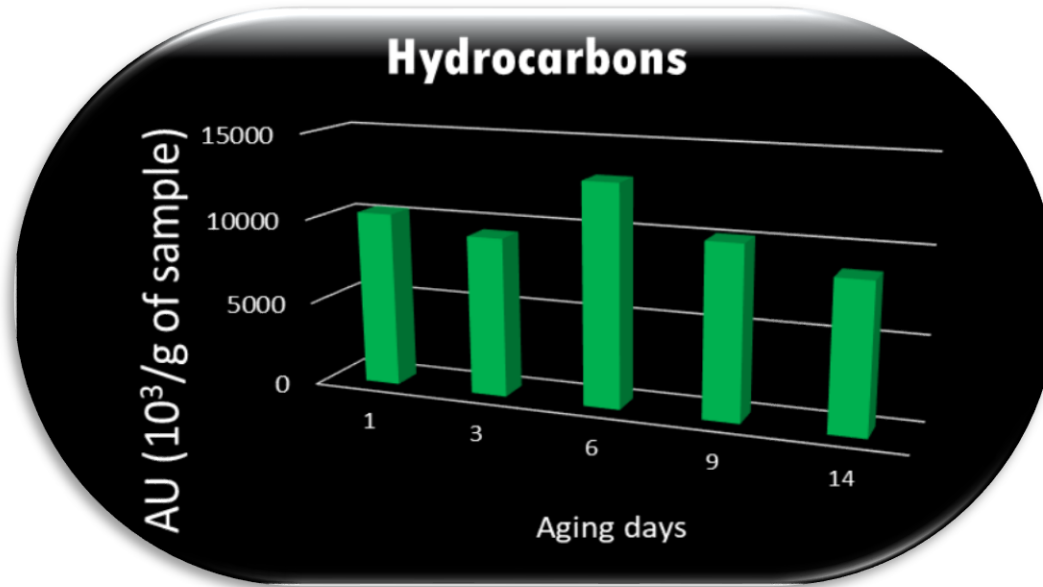
Alcohols

12

Aromatic Hydrocarbons

12

Results



Cooking processes

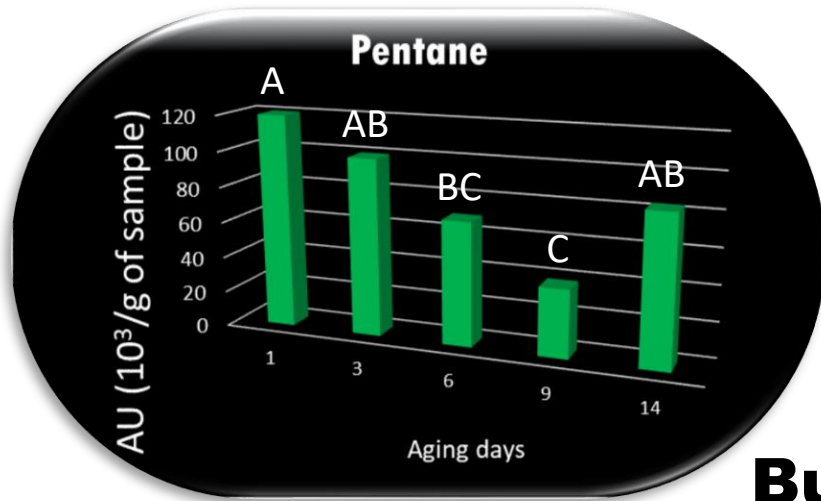
Thermal homolysis

Autooxidation of long chain fatty acids

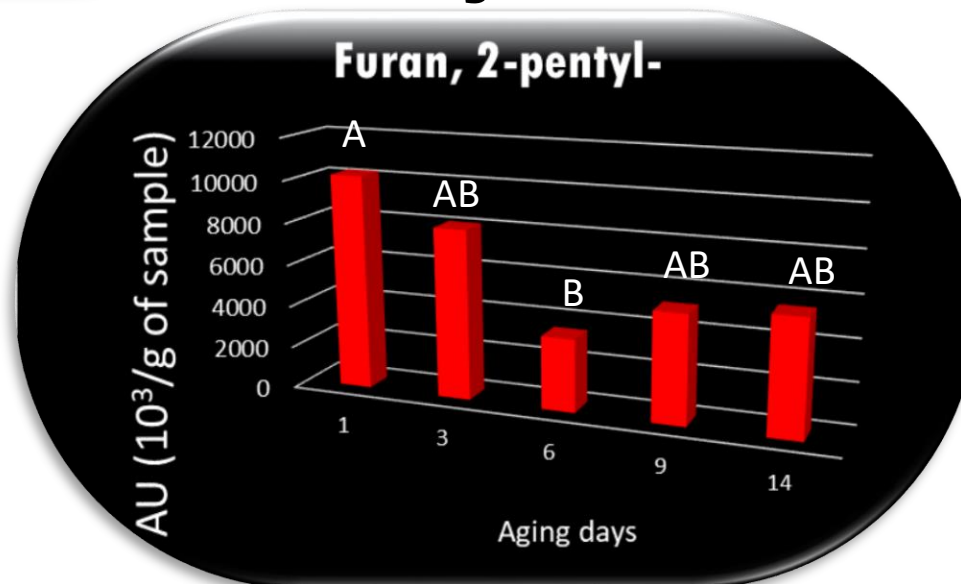
Different letters show statistical differences: A, B = P < 0.01)c

Results

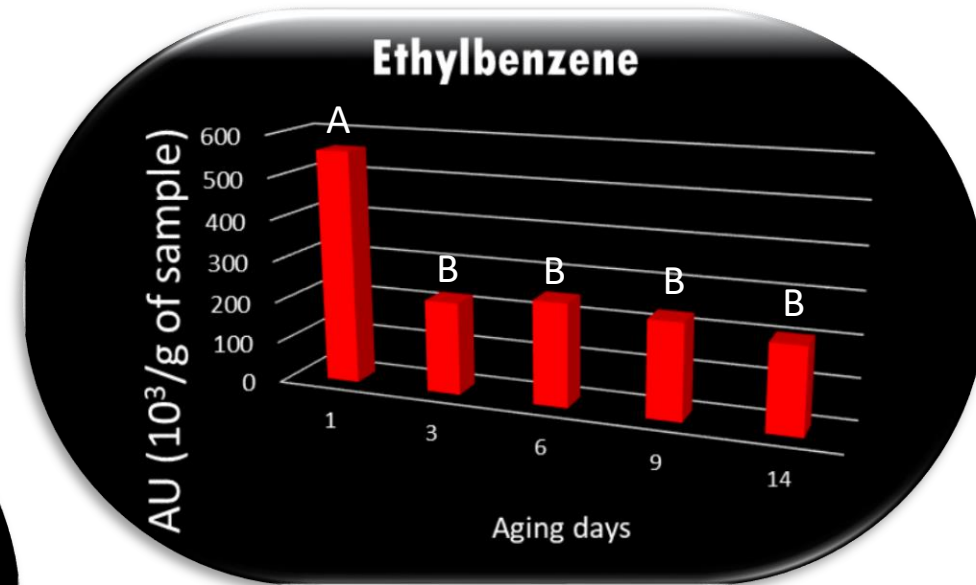
No particular aroma



Buttery flavour



Solvent flavour



Different letters show statistical differences: A, B = P < 0.01)

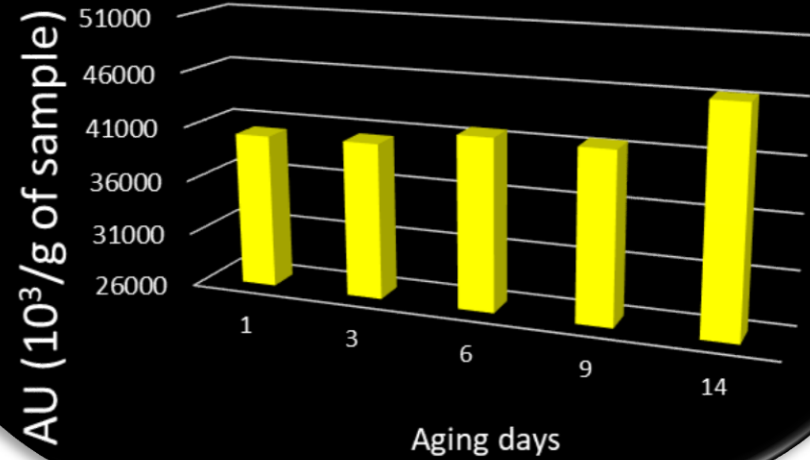
Results

Lipid oxidation

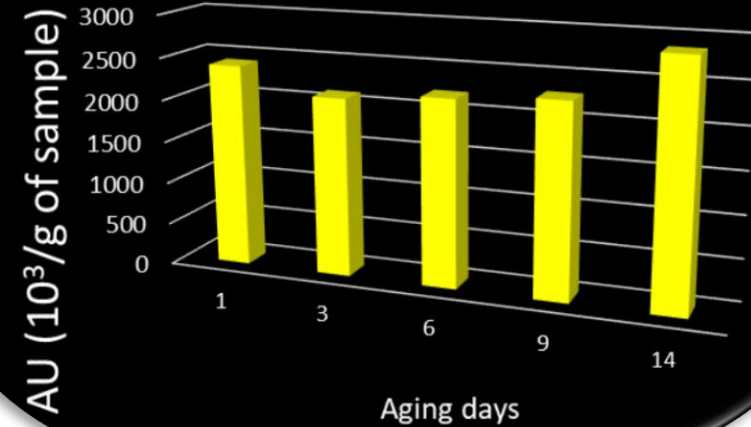
Fosfolipids

Fatty acids

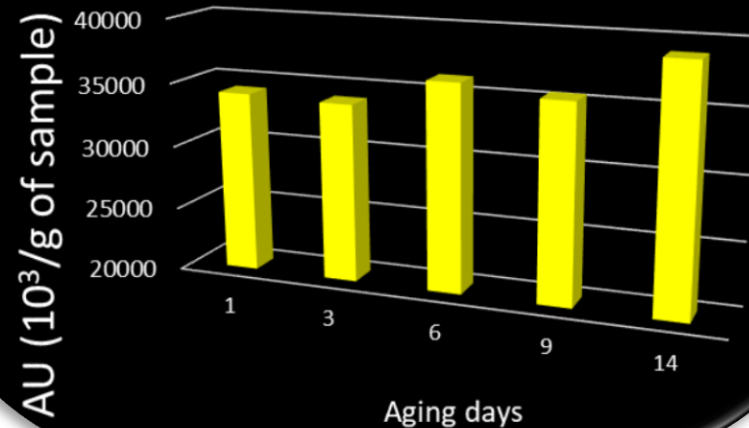
Aldehydes



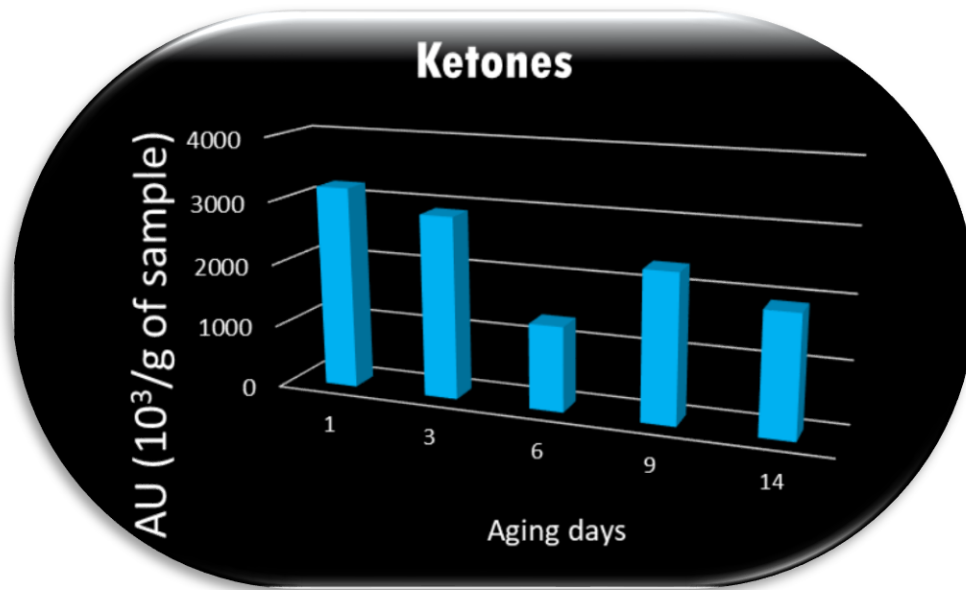
Pentanal



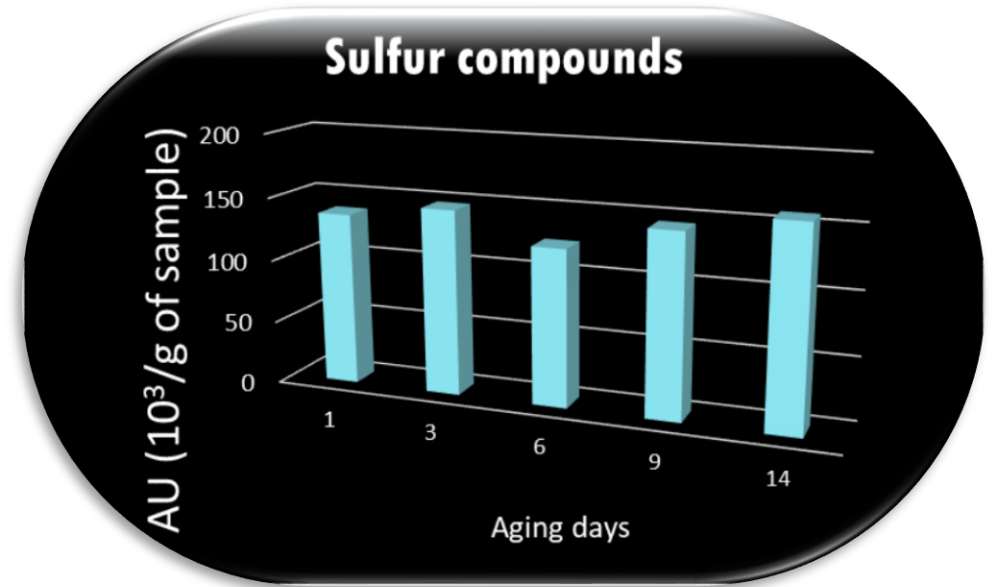
Hexanal



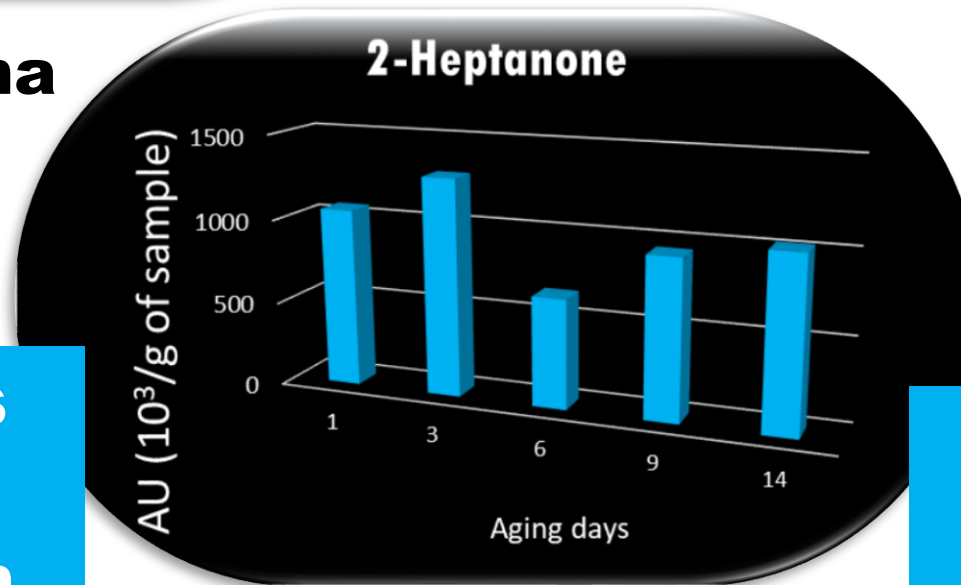
Results



Roasted aroma



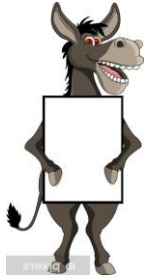
**Onion and
garlic aroma**



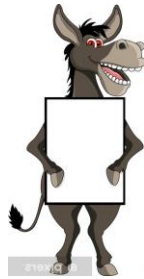
**Aminoacids
Strecker
degradation**

**Fatty acids
oxydation**

Concluding



Aging is a critical important point



Vacuum Aging?



14 days?

Thanks to all

