

## Introduction

Session 16 n. 24



Canestrato Pugliese, belonging to the category of Italian Pecorino cheese, is one of the most important and well known type of hard ripened cheese for the Apulia region (Southern Italy) economy. Pecorino is the trivial name given to the Italian cheese made from ewes' milk. The cheese derived its name and traditional shape from the rush basket "Canestro", in which the curd is put for the shape. In spite of the popularity, there are very few studies on the characteristics of cheese made from different ewe's breed milk.



## Objective

The focus of the work was to verify the relationship between aromatic profile and breed and territory to promote the socio-economical development of area and the safeguard of the Animal Genetic Resource (AnGR). For this purpose, the Volatile Organic Compounds (VOC) and sensory properties of Canestrato Pugliese cheese (ripened 12 months) produced from three sheep breeds (Altamura - AL, Comisana - CO and Gentile di Puglia - GP) were compared.

## Material and Methods

The experiment was carried out at CRA of Foggia's experimental farm, located at 76 m above sea level (41° 27' N; 15° 33' E), during the spring period. A flock was set up with three sheep breeds: Altamura (AL), Comisana (CO) and Gentile di Puglia (GP). All animals, homogeneous for day in milk (90±6) and body condition score (2.75), were fed on native pasture and supplemented with 400 g DM/head/day of concentrate feed, offered in two equal meals at milking. Three cheese-makings (Canestrato Pugliese) for each breed were carried out for three consecutive days. After 12 months of ripening, cheese samples were analyzed for Volatile Organic Compounds (VOC) and sensory properties. For each breed, VOC content and sensory properties of cheese was measured on 9 samples and in duplicate. VOC content was assessed by multiple dynamic headspace extraction and GC-MS. Cheese's sensory profile was detected by ten panellists. Each attribute was evaluated on a 0-9 point graduated scale. Data were processed by GLM and the means were compared by LSD test. Sensory data were normalised before submission to ANOVA repeated measures procedures (SAS).

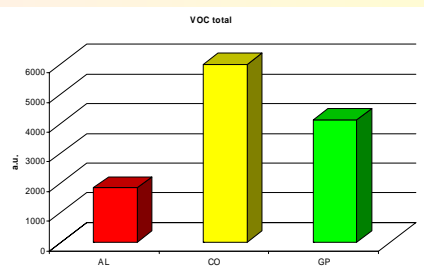
## Results and discussion

### Effect of sheep breeds on Volatile Organic Compounds (a.u.)

VOC content of Canestrato Pugliese cheese was affected by sheep breed. Comisana's cheese showed, with the exclusion of ketones higher content of alcohols, esters, acids, aromatic hydrocarbons and terpenes than other breeds.

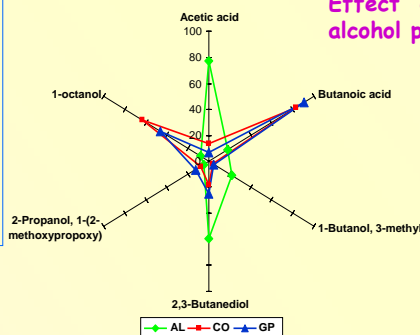
Compounds	AL	CO	GP	SE	breed effect
Aldehydes	99,21 <sup>ba</sup>	67,72 <sup>b</sup>	119,68 <sup>a</sup>	9,78	ns
ketones	122,1 <sup>b</sup>	151,12 <sup>a</sup>	192,2 <sup>a</sup>	12,14	*
Acids	874 <sup>b</sup>	3216,8 <sup>a</sup>	2657,4 <sup>a</sup>	367,12	***
Esters	86,12 <sup>b</sup>	102,67 <sup>a</sup>	87,94 <sup>b</sup>	3,35	*
Alcohols	395,23 <sup>b</sup>	1517,32 <sup>a</sup>	498,03 <sup>b</sup>	181,84	***
Sesquiterpenes	12,17	14,95	15,32	1,44	ns
Terpenes	50,64 <sup>b</sup>	513,55 <sup>a</sup>	265,51 <sup>a</sup>	37,47	**
A. hydrocarbons	191,41 <sup>b</sup>	412,01 <sup>a</sup>	295,66 <sup>ba</sup>	74,48	**

### Effect of sheep breeds on total VOC content (a.u.)



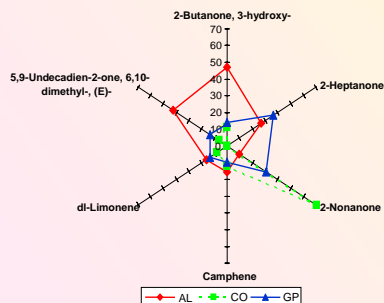
The highest total VOC content was found in CO cheeses (5996.1 a.u.), mostly represented by acids (about 55%) and alcohols (25%), while the lowest one in AL cheeses (1830.9 a.u.) mostly represented by acids (about 48%) and alcohols (21%).

### Effect of sheep breeds on acid and alcohol profile (%)



AL cheeses were characterised by the highest content in acetic acid (77.35%) and 2,3 butanediol (59.5%); CO ones by the highest content in butanoic acid (82.0%) and 1-octanol alcohol (63.0%); GP cheeses by the highest content in butanoic acid (90.35) and 1-octanol (45.8%), and 2-propanol alcohol (12.6%).

### Effect of sheep breeds on ketone and terpenes profile (%)

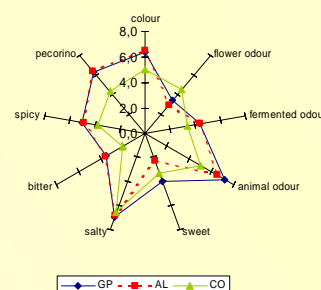


The most representative ketone in AL cheeses was 2-butanone, 3 hydroxy (46.90%), in CO ones was 2-nonanone (69.85%) and in GP cheeses was 2-epтанone.

Significant differences were detected also in the terpenes profile.

### Effect of breed on sensory profile of Canestrato pugliese cheese

Breed affected some parameters of cheese sensory properties. GP and AL cheeses showed a higher values of "pecorino", "bitter" and "spicy" taste than CO breed.



## Conclusions

Results indicated that Volatile Organic Compounds and sensory properties of Canestrato Pugliese cheese varied according to sheep breed. Our results indicated that the differences observed by instruments data, between the Canestrato Pugliese cheeses from different breed, were confirmed by the panel test. Cheese made with milk of AnGR are characterised by specify VOC and sensory profile.