

Comparison between sensory descriptors and flavour compounds in an ovine Portuguese traditional cheese (Serra da Estrela)

Introduction

Traditional cheeses often exhibit delicate and unique flavours that can be used to differentiate between cheese types, with the possibility of earning extra market value. However, the flavour chemistry of cheese is complex, with no single compound being responsible for the typical flavour; in fact, a balance of volatile compounds accounts for the flavour key notes is associated with each particular cheese variety (Curioni *et al.* 2002).

Recall that the flavour profile of a given food product is the most rapidly perceived and important criterion for consumers' preference (Delahunty 1994). Instrumental methods of analysis measure what is present in a given cheese, but they are unable to determine which specific compounds are responsible for specific flavour; to finely accomplish this, human sensory assessments should be involved (Delahunty 1994).

The overall goal of this research was to identify chemical components that are responsible for key flavour attributes, using specific sensory language of (traditional) cheeses, by a trained panel.

Materials and methods

A set of 12 (trained) panelists were involved in the flavour analysis of the cheese. A list of common attributes defined from previous studies encompassing a similar set of products was prepared. Serra da Estrela cheese flavour profiling was thus performed in three sessions: in each one, the panel was exposed to Serra da Estrela cheese samples at 45 d ripening; based on the list, they had to identify/quantify the main cheese descriptors. SPME was used as concentration technique before analysis of a range of cheese odour/flavour compounds by GC-MS.

Results and discussion

The main descriptors for Serra da Estrela cheese are presented in Figure 1.

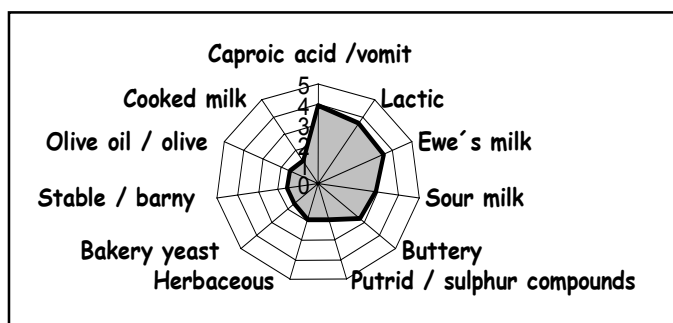


Figure 1: Serra da Estrela flavour profile 45 d ripening.

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The volatile profile of Serra da Estrela cheese at 45 and 60 d ripening could essentially be represented by volatile fatty acids (VFA). From the data included in Figure 2, it can be concluded that butyric and hexanoic acids are the most abundant VFA in this cheese. On the other hand, the content of VFA increased as ripening time elapsed.

This research allowed one to conclude that acetic, propionic, butyric, isovaleric and caproic acids were responsible for the main aroma attributes of the cheese at stake and corresponded to the sensory descriptors: sour milk; cooked milk; buttery; cowy/stable/olive; oil/olive; and caproic acid/vomit, respectively (once the most frequent compounds were identified, it was important to assess their aroma impact via sensory studies that were carried out with the aforementioned compounds, so as to confirm the impact in sensory perception of this cheese).

Further research is still needed to identify the chemical compounds responsible for the bakery yeast and sulphurous sensory descriptors.

References

- Curioni, P.M.G. and Bosset, J.O. (2002), Key odorants in various cheese types as determined by gas chromatography – olfactometry. *Int. Dairy J.* **12**, 959-984.
Delahunty, C.M. *et al.* (1994), Flavour evaluation of Cheddar cheese. Developed from a Symposium sponsored by the Division of Agricultural and Food Chemistry **633**, 202-216.

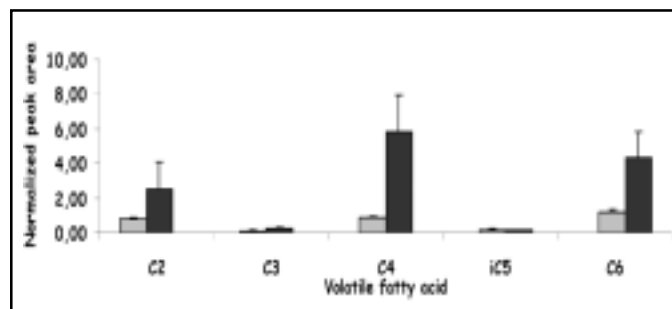


Figure 2: Relative abundance of VFA (acetic, propionic, butyric, isovaleric and hexanoic) in Serra da Estrela cheese, at 45 (shaded bar) and 60 (black bar) d ripening.