**Background**

Bakery products are a large group of foodstuffs widely consumed on a daily or occasional basis for nutrition, pleasure or both. All of these products contain fats/oils for nutritional, technological and organoleptic purposes. However, these components are also often the source of product deterioration. Indeed, the oxidation of fats and oils are common reactions that may impact deleteriously upon flavour, aroma and nutritional quality and, in some cases, the texture of a product. This study involves a comparison of two different techniques of headspace analysis for measurement of the volatiles produced in oat based products throughout a normal shelf life through to rancidity. The model product is an oatcake; a type of cracker made from oatmeal.

**Materials & Methods**

- **SPME-GC-MS**
  - Material: Carbowax-polydimethylsiloxane (PDMS) SPME fibre.
  - Analysis using a Thermo Finnigan Tempus GC-ToF-MS system.
  - Data acquired using the Xcalibur™ software.
  - Statistical analysis performed using GenStat™ version 9.2.0.153.

- **ATD-GC-MS**
  - Material: Stainless steel tube containing a bed of Tenax TA.
  - Volatiles trapped at 200°C in 1 min.
  - Analysis performed using a Markes International Autosac Security ATD system coupled to an Agilent Technologies 6890 GC and 5975B MSD.
  - Data were acquired using the MSD chemstation™ software.
  - Statistical analysis was performed using GenStat™ version 9.2.0.153.

**Results and Discussion**

- Rancid samples are mainly separated from fresh samples on the basis of changes in the composition of the aldehydes.
- Zhou, M. et al. (2000) reported the influence of aldehydes, particularly hexanal and pentanal, in the development of off-flavours from cereal.
- Therefore the ATD approach shows promise for determining the stage of the shelf life of oat based products.

**Future work**

- Study the effect of added natural antioxidants on the shelf life of oat-based products using ATD-GC-MS techniques.
- Determine the source of the volatiles in terms of the lipid composition of oat products.
- Follow the product in detail from pre-production to confirmed rancidity, elucidate the key factors and mechanisms involved in the rancidity process.

**References**


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