Context & Objective

Facing a slower growth of beer consumption in Western countries and hard price competition from places like Brazil and China, brewers need to develop new products, new packaging and new fashions for adults looking for variety and new tastes. These companies have to develop new beers more and more rapidly to fit new lifestyles and drinking occasions by launching a wider range of innovative beers: beer with caffeine, guarana and ginseng, well balanced drinks with selected hops and aromas of blackberry, raspberry and cherry, functional beers claimed to be anti-aging beers…

In order to launch successfully new beers, brewers need to compare their products with competitors' beverages. The ability to determine the taste characteristics of new products will enable producers to more rapidly develop beers that fit consumer tastes.

In this application note, the objective was to compare the taste and flavor of beers with competitive brands using an electronic tongue.

ASTREE electronic tongue

The ASTREE Electronic Tongue (fig. 1) is based on liquid sensor array allowing a measurement of potential difference between each sensor and a reference electrode. Each sensor has a specific organic membrane, which interacts with chemicals present in the liquid sample in a specific manner. Recorded data are processed by the software as a global taste *fingerprint*.

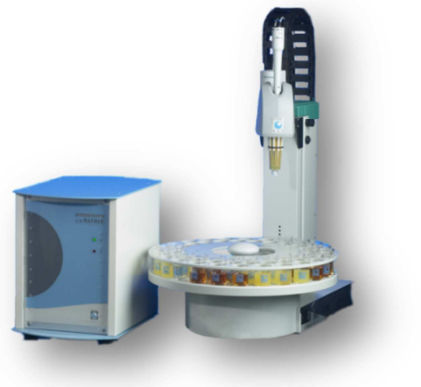

Fig.1: ASTREE Electronic Tongue (Alpha MOS, France)

Analytical Method

Samples

6 brands of beers with various quality and alcoholic contents have been analyzed.

Brand Products	Type	Alcoholic Content (% v/v)
1664	Dark	6.3
Kanterbrau	Lager	4.7
Kronenborg	Lager	4.7
Pelford	Dark	6.5
33 Export	Lager	4.8
Tuborg	Lager	5.6

Analytical conditions

Sample volume used	100 mL
Temperature	ambient
Time between analyses	180 sec
Acquisition time	120 sec
Rinsing Time	60 sec

Brand discrimination

The ASTREE Electronic Tongue is able to distinguish each commercial beer from one another. ASTREE analysis and differentiation is not linked to the percentage of alcohol or the type of beer (lager or dark) but with the global taste of the product.

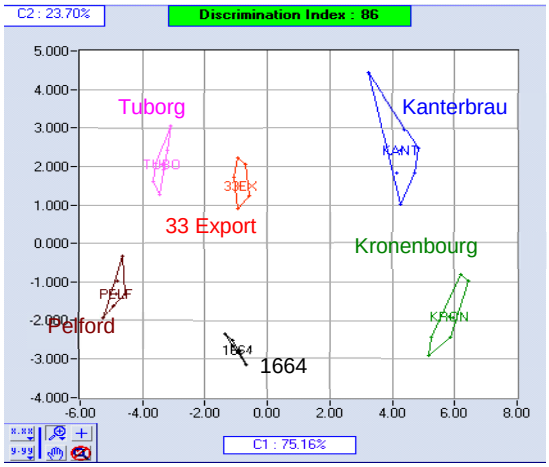

Fig.2: Taste map based on Principal Component Analysis (PCA)

Brewers using the ASTREE Analyzer are able to obtain a better understanding of competitive brands. This simplifies the taste optimization process in new product development.

Conclusion

Breweries must anticipate competitive strategies and increase market share with new and attractive beverages more closely allied with changing consumer tastes.

Alpha MOS instruments allow the benchmarking of various brands in terms of taste and flavor and help brewers to create new and more competitive products faster.

ASTREE system offers greater speed than traditional analytical techniques and provides more objective answers compared to sensory panels. The speed of analysis offers the opportunity to test a larger number of beers.