

Implicit Identification: Applications to Off Flavours in Milk

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Introduction

When investigating products with only subtle differences, e.g. off-flavours in milk, descriptive analysis may miss possible off-flavours (1). Still their presence may affect consumer choice. Reasons to miss off-flavours in descriptive analysis could be: not all possible descriptors can be known in advance; the intensity may be too low to enable scoring; assessors may be adopting an analytical mind-set which impedes detection of subtle effects.

Two studies were performed with different types of milk. **Experiment 1:** 3 different feeds (H, U & S) with very different fatty acid compositions. **Experiment 2:** 2 different types of fodder (G & M). Both experiments were full cross over designs resulting in 3 or 2 trials. The milk was stored 1 (D1) and 4 days (D4) before analysis.

Descriptive Analysis

Descriptive analysis (trained panel N = 15 or 11 assessors; 2 or 3 replicates; 15 or 6 descriptors). Data were analysed by ANOVA Partial Least Squares Regression (APLSR (2)).

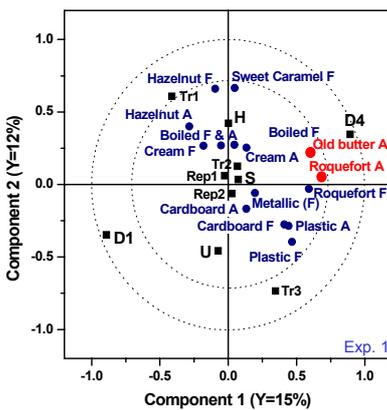


Fig. 1. Correlation Loading plot from a PLS2 analysis of all design variables and the descriptive analysis results. Significant descriptors indicated with red.

Exp. 1: Only two of the 15 descriptors show a significant effect ($p < .001$) of storage (Fig. 1). Fresh milk is often regarded as rather bland (3), which can be seen in the plot, since no descriptors correlate well with products stored one day (D1).

Exp.2: 4 of the 6 descriptors showed a significant effect for feed type ($p < 0.001$, not shown here).

Implicit Identification Test

The *Implicit identification Test*, inspired by the authenticity test (4), allows an affective evaluation to be given by consumers who drink milk every day. The consumers have an expectation as to what constitutes the *typical* taste of milk. These expectations are encoded without the subjects' awareness and, hence, are *implicit*. The purpose of the test was not revealed to the subjects. Instead an upsetting, untrue, story concerning foreign milk on the Danish market was told. The assumption is that the generally nationalistic Danish milk drinkers (5), will adopt an emotional mind-set, enabling them to unconsciously react to very subtle differences.

Exp. 1: A logistic regression showed a clear main effect of storage (Fig. 2).

There were no differences among the products that had been stored for one day. After four days of storage, products H and U differed from S. The effect of storage was only significant for feed type H and U.

Exp. 2: A logistic regression showed a clear main effect of feed type, which seems to be different between trials. In Fig. 3 it looks like feed-type G milk is the one, least similar to what the consumers are used to, since it is more often identified as foreign.

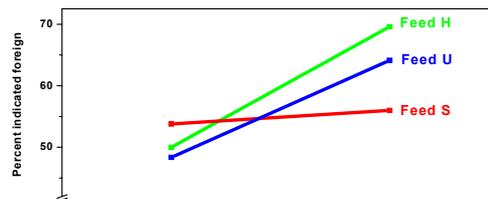


Fig. 2. Exp.1. Samples "identified" as foreign.

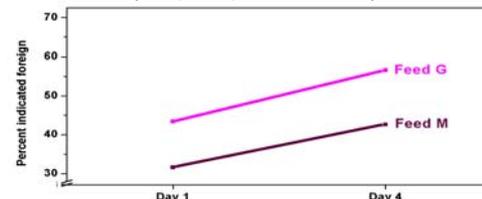


Fig. 3. Exp.2. Samples "identified" as foreign.

Relating to Descriptive Analysis

Exp.1: APLSR showed a significant correlation between the samples identified as "Danish" and the descriptive terms *Sweet caramel flavour* and *Roquefort flavour* (positive correlation) and *Metallic flavour* (negative correlation), and between "foreign" and *Metallic flavour* (positive correlation) and *Sweet caramel flavour* and *Roquefort flavour* (negative correlation) (not shown here).

Exp.2: APLSR showed that both *Cardboard* and *Metal flavour* were significantly positively correlated with "foreign" (see Fig.4).

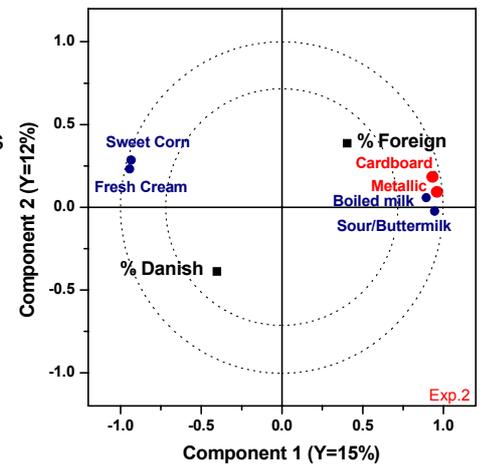


Fig. 4. Correlation Loading plot from a PLS2 analysis of design variables & the *Implicit Identification Test* results. Significant descriptors indicated with red.

Conclusion

The results suggest that the ability to perceive flavour was sharpened in the absence of conscious recollection of previous experience with the product type. By using the *Implicit Identification Test* it was possible to discriminate among some of the products with regard to storage. When descriptive profiling was used only a weak effect of storage was evident in the first experiment. This may mean that the sensory profiling did not unveil subtle differences in off flavour although the subjects in the *Implicit Identification Test* were able to identify an effect of storage for two of the feed types. In experiment 2 only an effect of feed type was found by the descriptive analysis. Milk products identified as "foreign" appear to possess different off-flavour-like characteristics, compared to the ones identified to be "Danish". In experiment 2, the descriptors correlating to "foreign" are more off-flavour like, compared to the milk identified as "Danish". This is in line with what is expected from the rather nationalistic Danish milk drinkers.

Our results suggest that the *Implicit Identification Test* & Descriptive Analysis make use of different evaluative processes

References

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