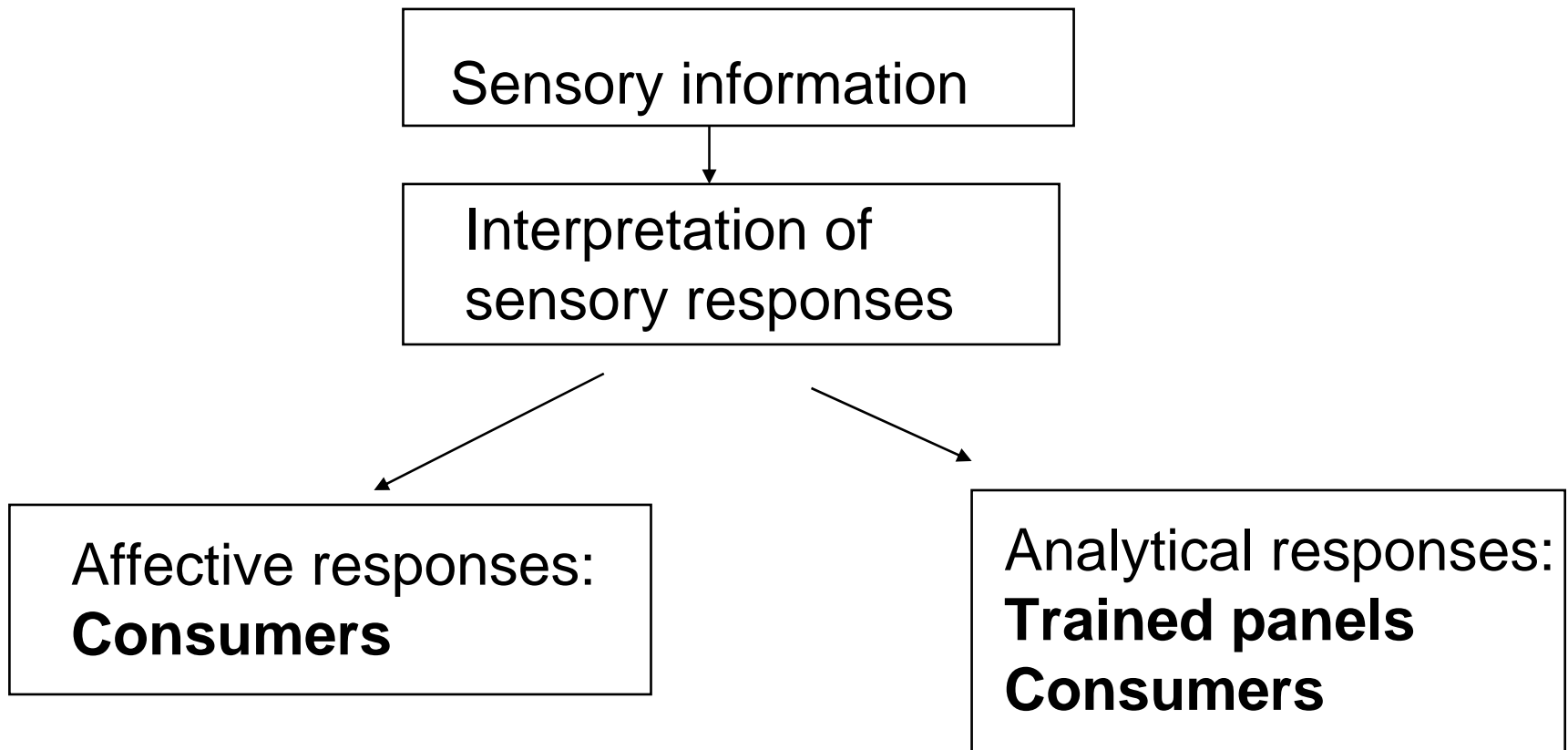


Multivariate Analysis: A comparison of descriptive data from consumers and trained assessors

ESN conference May 26. 2005

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Sensory responses from consumers and trained panels



Important question related to analytical responses:

Is the perception of a set of food products from a trained panel representative for the perception from a group of consumers?

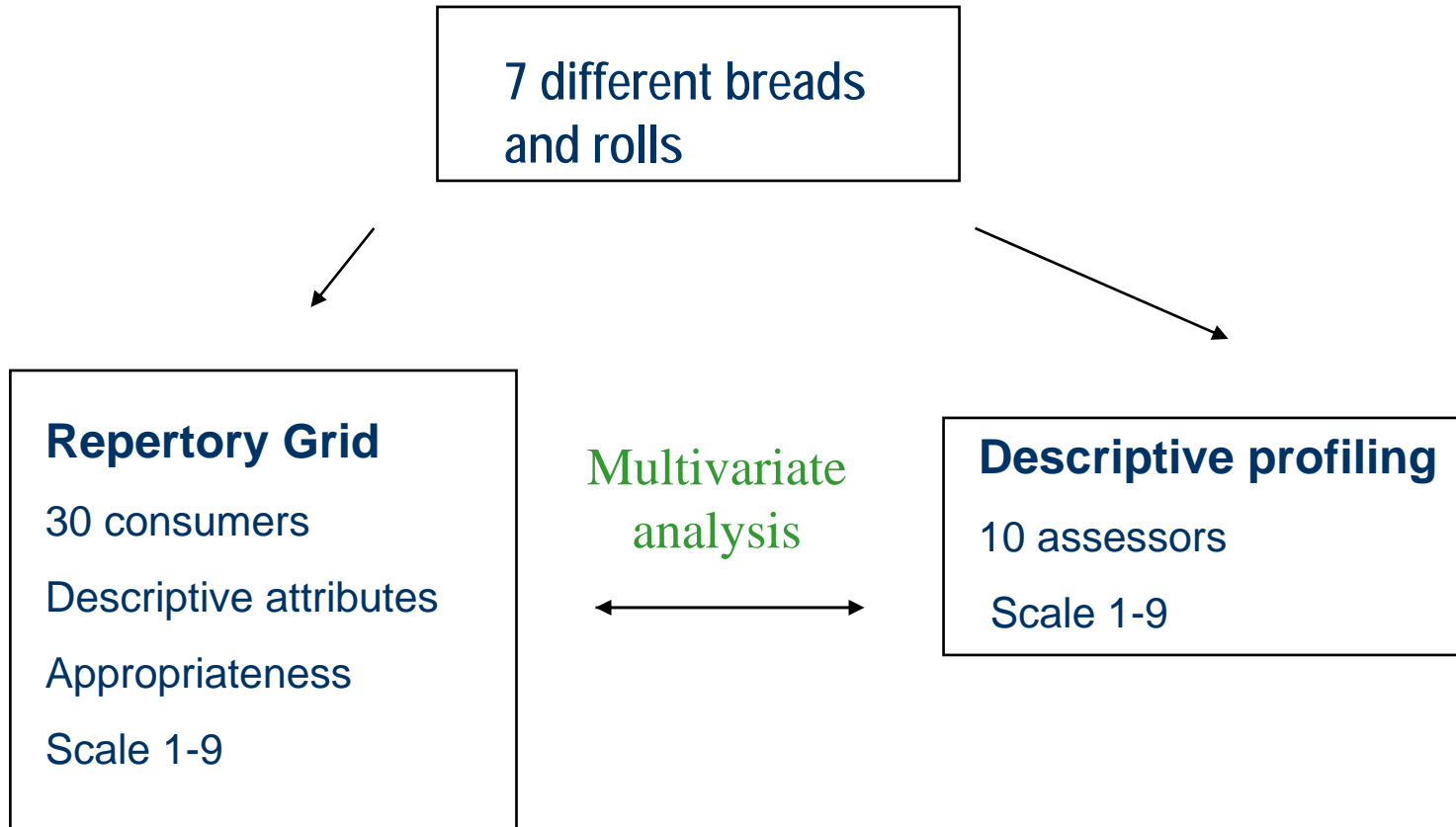
Main objectives of the study

- I: Investigate consumers' perception of bread and compare the used vocabulary with descriptive attributes used by a trained panel

- II: Investigate perceived appropriateness of different breads and relate this information to the defined sensory attributes

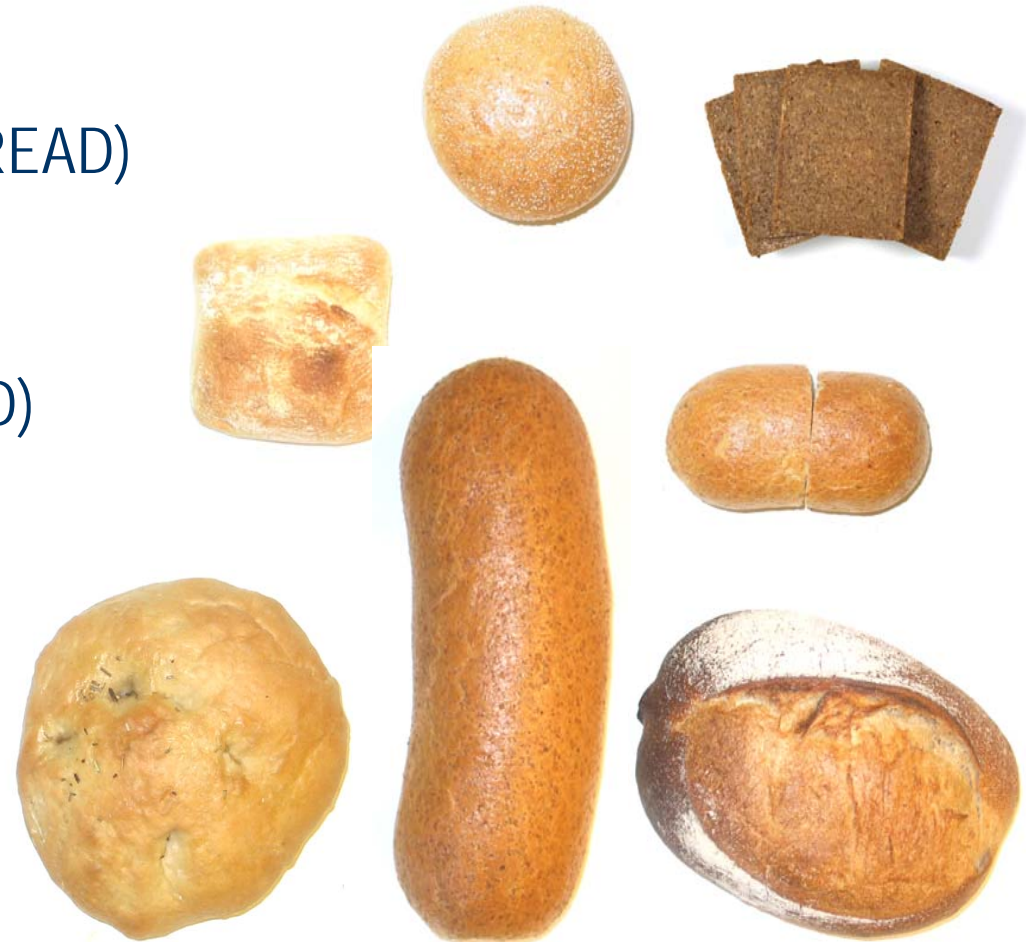


Approach



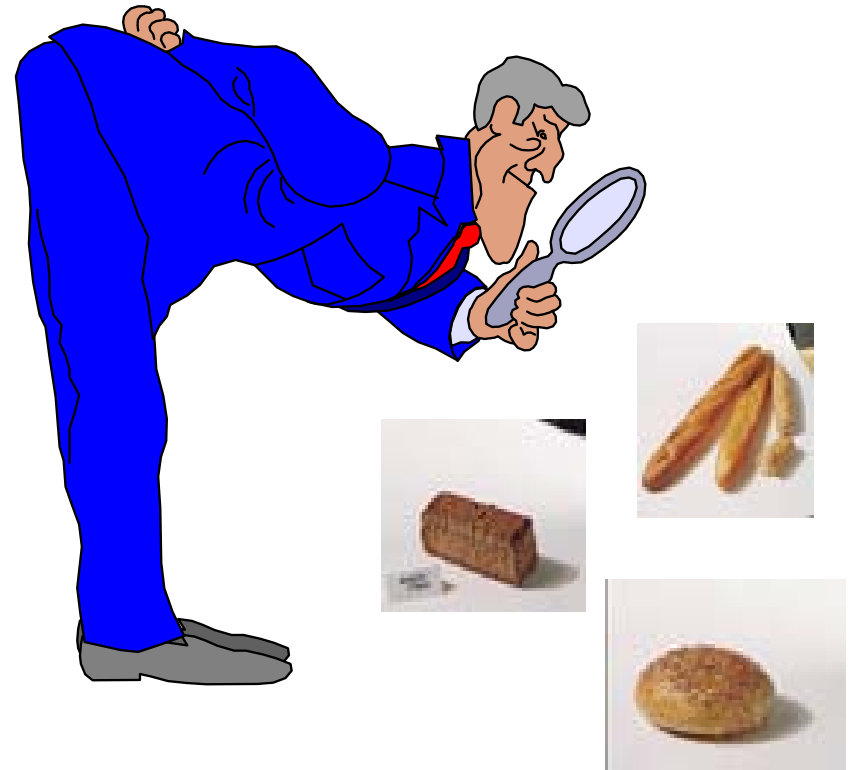
Products

- Whole-grain bread (W.G.BREAD)
- White rolls (W.ROLL)
- Whole-grain rolls (W.G.Roll)
- Dark rye-bread (D.R.BREAD)
- Foccacia (FOCC)
- French bread (F.BREAD)
- Ciabatta (CIAB)



Repertory Grid Method (RGM)

- RGM is a method for vocabulary development
 - trained panel
 - consumers
- Principle:
 - Presenting sample triads to subjects and ask them to describe similarities and differences between these samples



RGM - Procedure in this project

Session 1: Warm-up

- Discussion about different aspects of bread consumption

Session 2: Eliciting of constructs

- presentation of triads
- relevant constructs for describing bread
- constructs for appropriateness

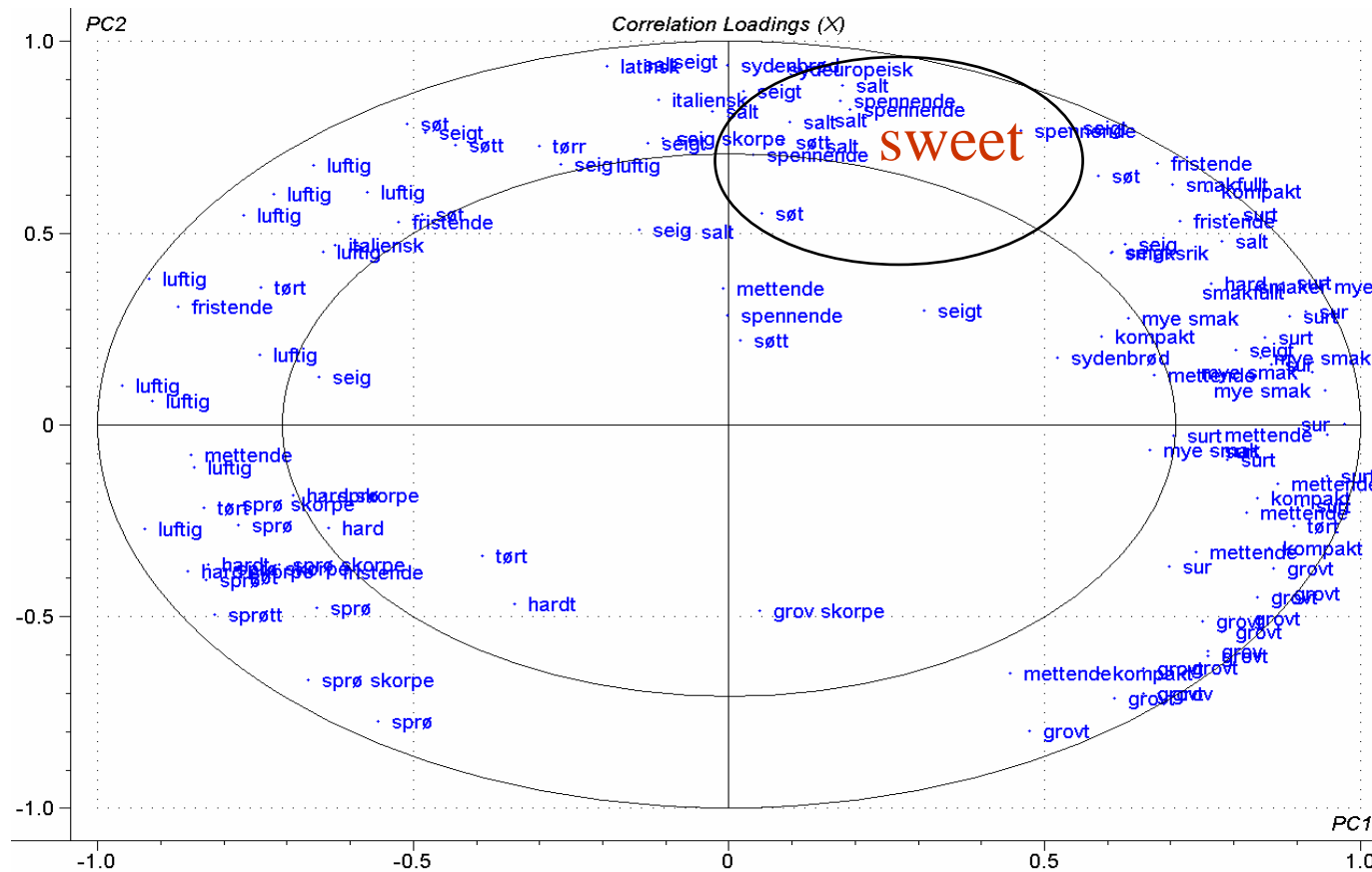
Session 3: Intensity ratings

- Reporting intensity of the individual constructs (scale 1-9)

Data treatment

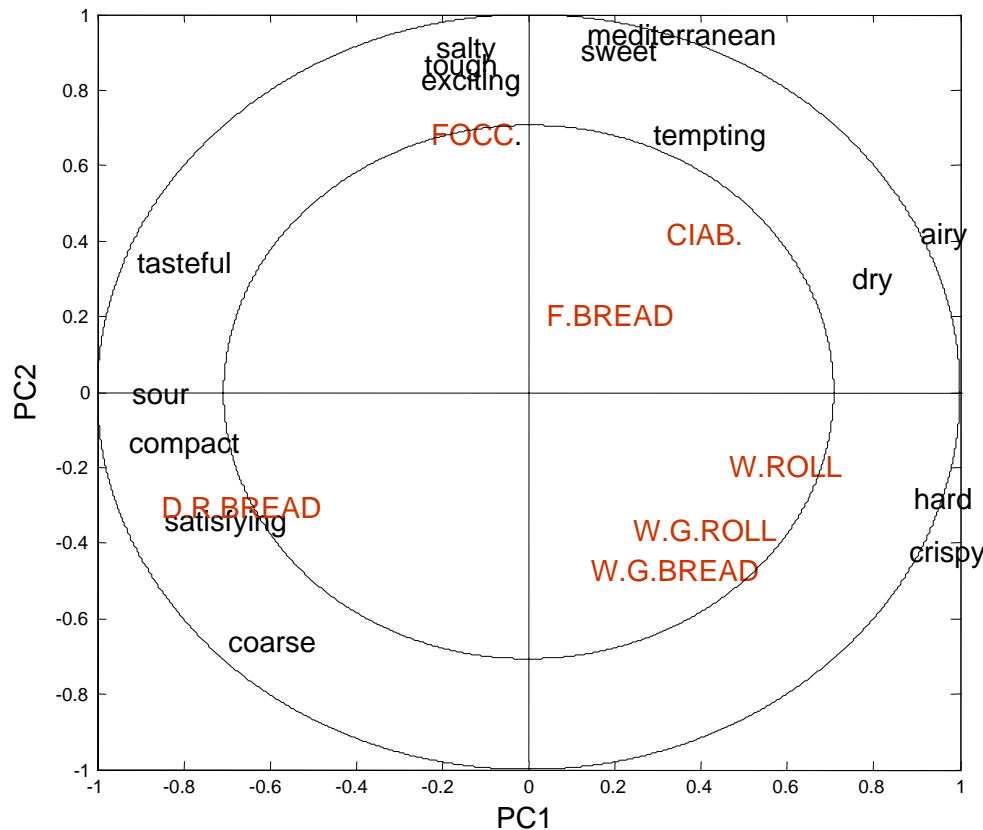
- Constructs used more than 5 times were kept in the analyses
- Constructs were classified into
 - descriptors for sensory attributes
 - descriptors for appropriateness
- Data analyses
 - Multivariate analysis
 - (Generalised Procrustes Analysis is a common method)

Preliminary PCA of sensory data from consumers (PC1: 55%, PC2:27%)



Sensory data from consumers

results from PCA, PC1: 52%, PC2:34%



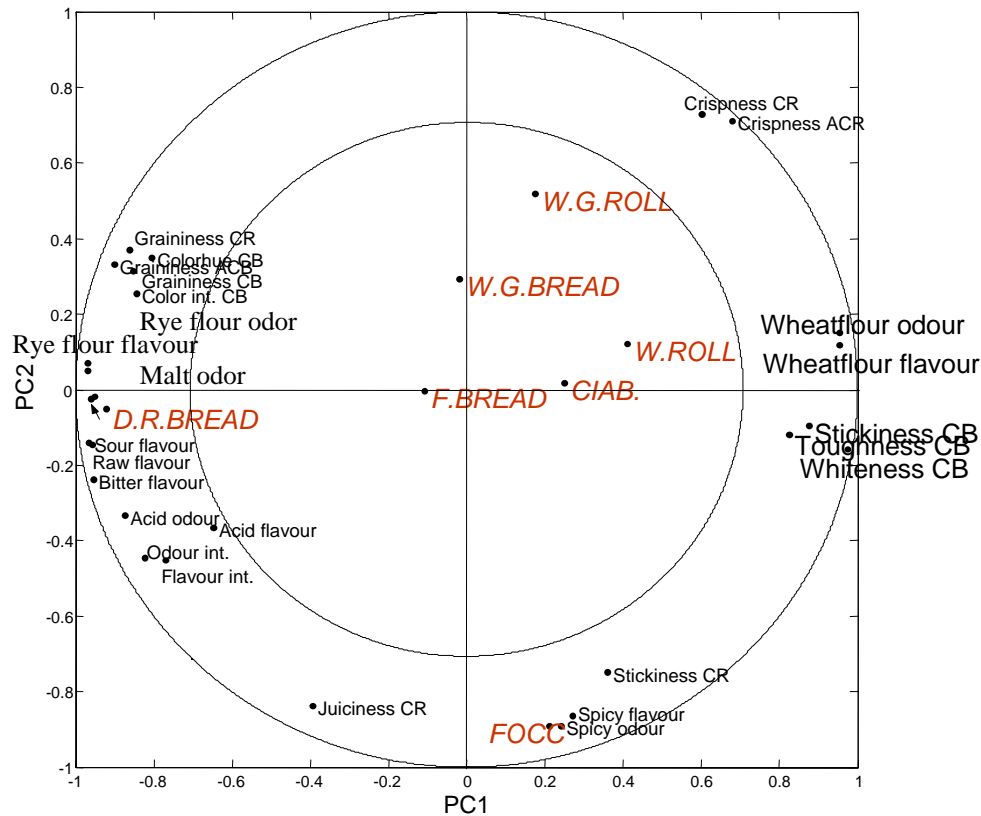
Comment:
The consumers described the variation between the bread using many texture attributes.

Descriptive data

- Trained panel at Matforsk (ISO 1993, ISO 1988)
- Developed test vocabulary for crust and crumb of the breads
 - 38 attributes
 - Scale 1-9
 - Two replicates
 - Randomised presentation of the samples
- Statistical methods
 - ANOVA
 - Multivariate analysis

Sensory data from trained panel

results from PCA, PC1: 68%, PC2: 22%



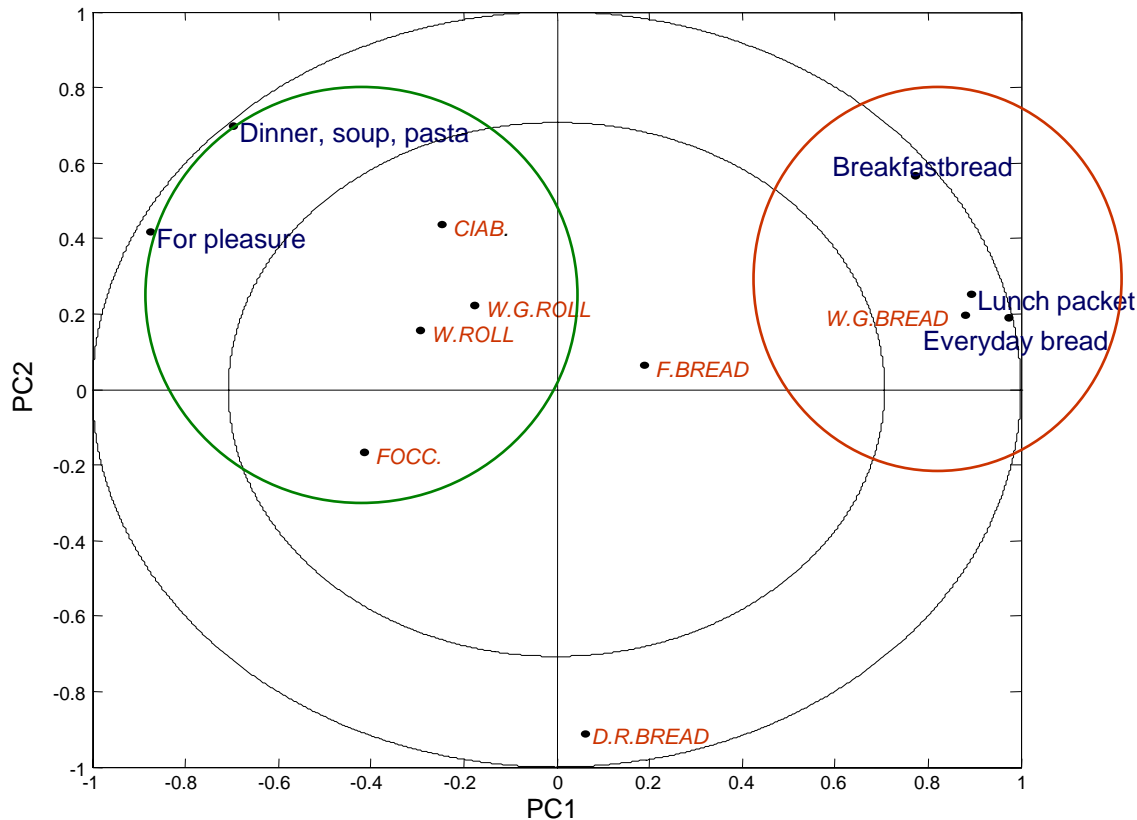
Comment:
 The trained panel used attributes for appearance, odour, flavour, and texture. Many of them highly correlated

Comparing of vocabulary

- Partial Least Squares regression (PLS)
 - X-expl = 68%, 22%, Y-expl = 30%, 25%
- For verbal description of the texture of the breads, the two panels used many identical words.
- While the trained panels described flavour and odour using sensory attributes related to the ingredients (rye,wheat,malt) in the breads, the consumers used sensory attributes as sour, compact, satisfying and coarse.
- The trained assessors used more attributes than the consumers, however the total explained variation (from PCA) between the breads was quite equal

Consumer constructs for appropriateness

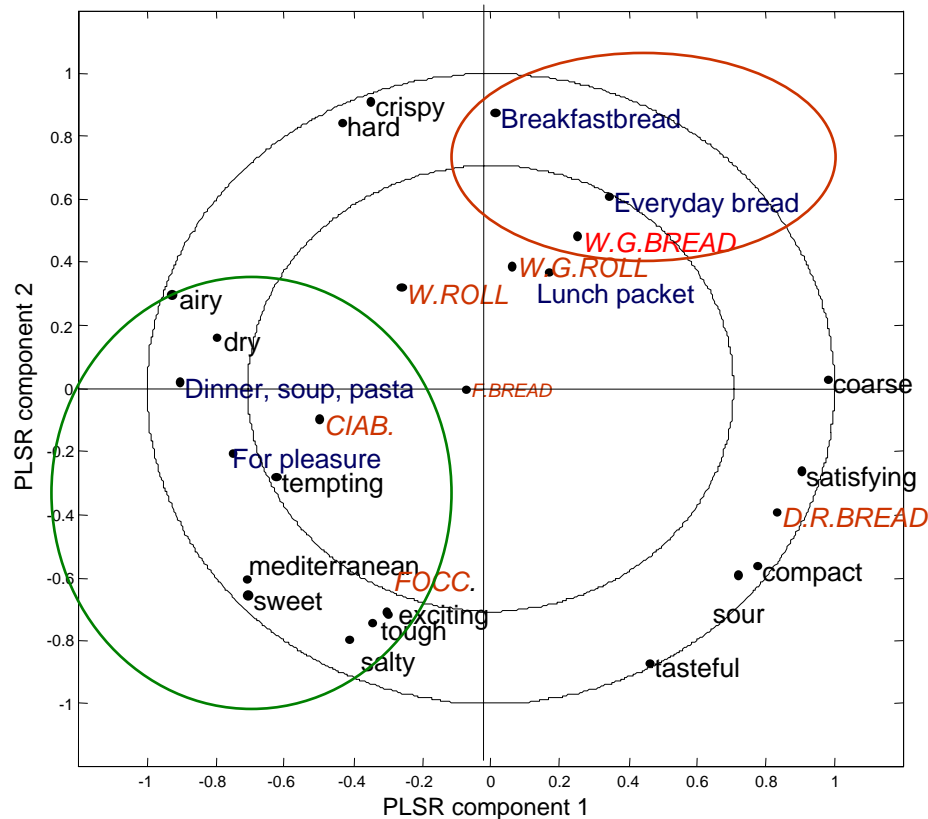
Results from PCA, PC1: 73%, PC2: 20%



Comment:
 The consumers pointed out two main groups of appropriateness of use:
 "Everyday bread"
 "For pleasure"

PLS - sensory attributes as x-variables and appropriateness as y-variables

(X-expl = 44%, 41%, Y-expl = 30%, 25%)



Conclusions

- The consumers used fewer words for describing the breads than the trained panel
- Some important differences to note
 - the trained panel used words related to type of flour
 - the consumers used words related texture (compact, satisfying)
- The consumers assigned the breads into groups for appropriateness

Conclusions

- Multivariate analysis are important methods for finding patterns in data
 - PCA reveals systematic in one data set
 - PLS reveals correlation between different data sets
- There is a need for more insight in consumers vocabulary and consumers cognitive perception of food products.

My presentation is based on:

Hersleth, Berggren, Westad and Martens (2005),
"Perception of Bread: A Comparison of
Consumers and Trained Assessors",
Journal of Food Science, 70, 2, 95-101.

Thanks for your attention!