LEXICON DEVELOPMENT AND NAPPING FOR THE SENSORY DESCRIPTION OF RYE BREAD IN NORTHERN EUROPE AND THE UNITED STATES

Meetha James, Delores Chambers, Kadri Koppel, Edgar Chambers IV
Center for Sensory Analysis and Consumer Behavior
Dept. of Food, Nutrition, Dietetics, and Health, College of Human Ecology

Center for Sensory Analysis and Consumer Behavior

KANSAS STATE UNIVERSITY

Introduction

- Rye Bread is well know for its Flavor Versatility.
- A limited number of studies have been done to understand the sensory characteristics of rye breads

Northern European Rye bread

US Rye bread

Objectives

- To develop a lexicon which acts as a tool for understanding the flavor profile of rye bread consumed in Northern Europe and the US.
- To understand existing market trend and white spaces by napping rye breads.

Methods

LEXICON DEVELOPMENT

- 7 highly trained panelists from Center for Sensory Analysis and Consumer Behavior developed a sensory lexicon to describe a wide range of rye breads.
- 32 Rye bread samples from Northern Europe and the US were used for the profiling.
- The lexicon developed had 28 flavor attributes.
- The lexicon was also evaluated to check its validity with representative samples from Northern Europe and the US.

NAPPING

- Napping is done using a "Nappe" which means a white cloth in French. Five sensory analysts arranged the rye breads based on their similarities and differences on the Nappe.
- Samples that are far apart from each other means that they are different in their sensory characteristics.
- White spaces identified in the map helped identify target areas for potential new product development.

DATA ANALYSIS

Principle component analysis (PCA), Cluster Analysis (CA) and Multifactor Analysis (MFA) was conducted using XLSTAT software to visualize the relationships among sample attributes.

Results/Findings – Lexicon Development

Lexicon Development

28 Sensory Descriptors

- Overall grain
- Wheat-like
- Rye
- Bran
- Malt
- Musty-dry
- Nutty
- Brown
- Toasted
- Burnt
- Brown-sweet
- Molasses
- Honey
- Dark-fruit
- Dark-chocolate
- Dough-like
- Leavening
- Yeasty
- Fermented
- Caraway
- Coriander
- Dill
- Anise
- Salt
- Sweet
- Sour
- Bitter
- Astringent

Overall Grain A general term used to describe the aromatic which includes musty, dusty, slightly brown, slightly sweet and is associated with harvested grains and dry grain stems.
Reference: Bob's Red Mill Wheat Bran = 6.0 (f)
            Bob's Red Mill Oat Bran= 13.0 (f)
Preparation: Serve in 1 oz. cup.
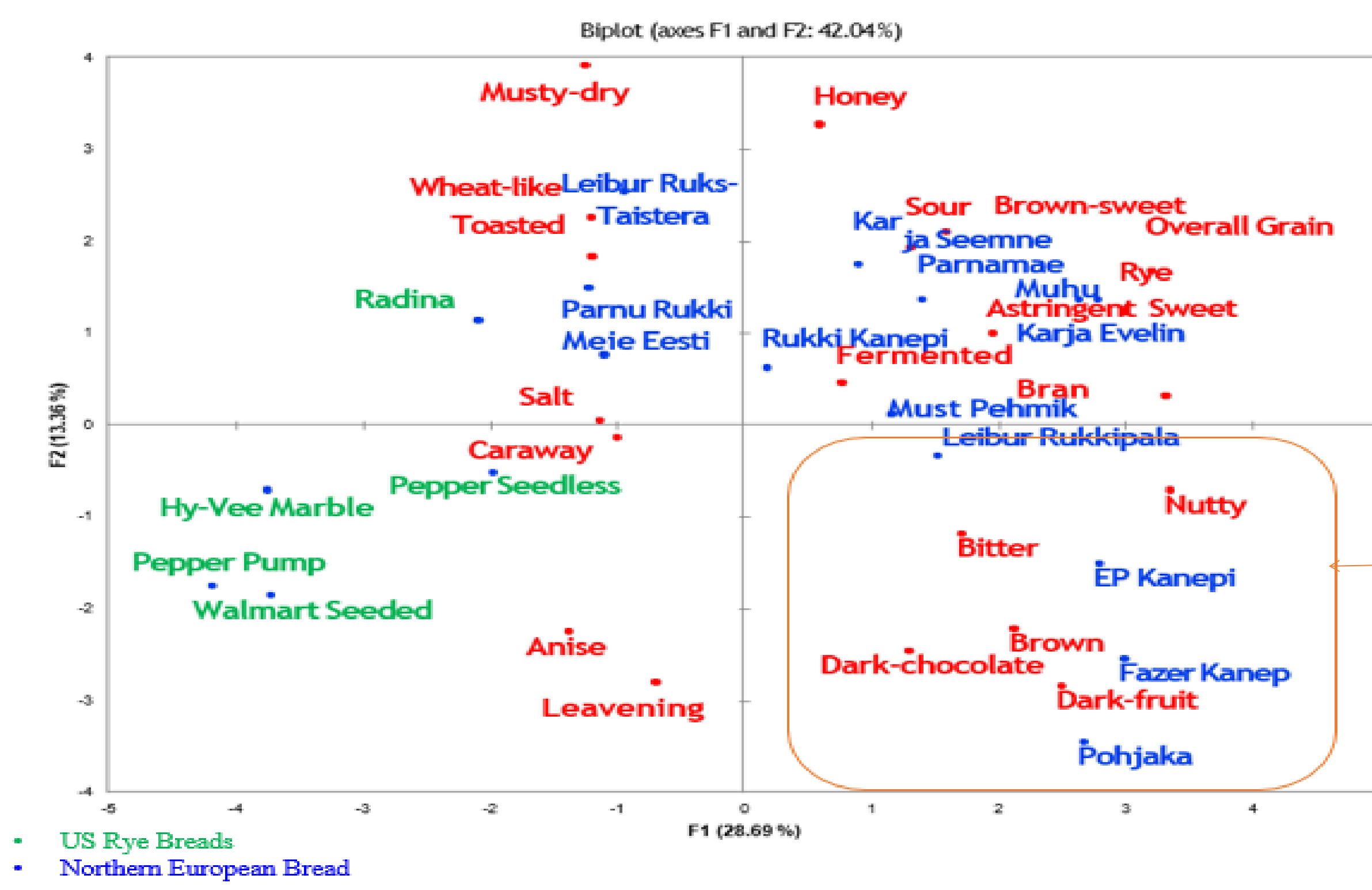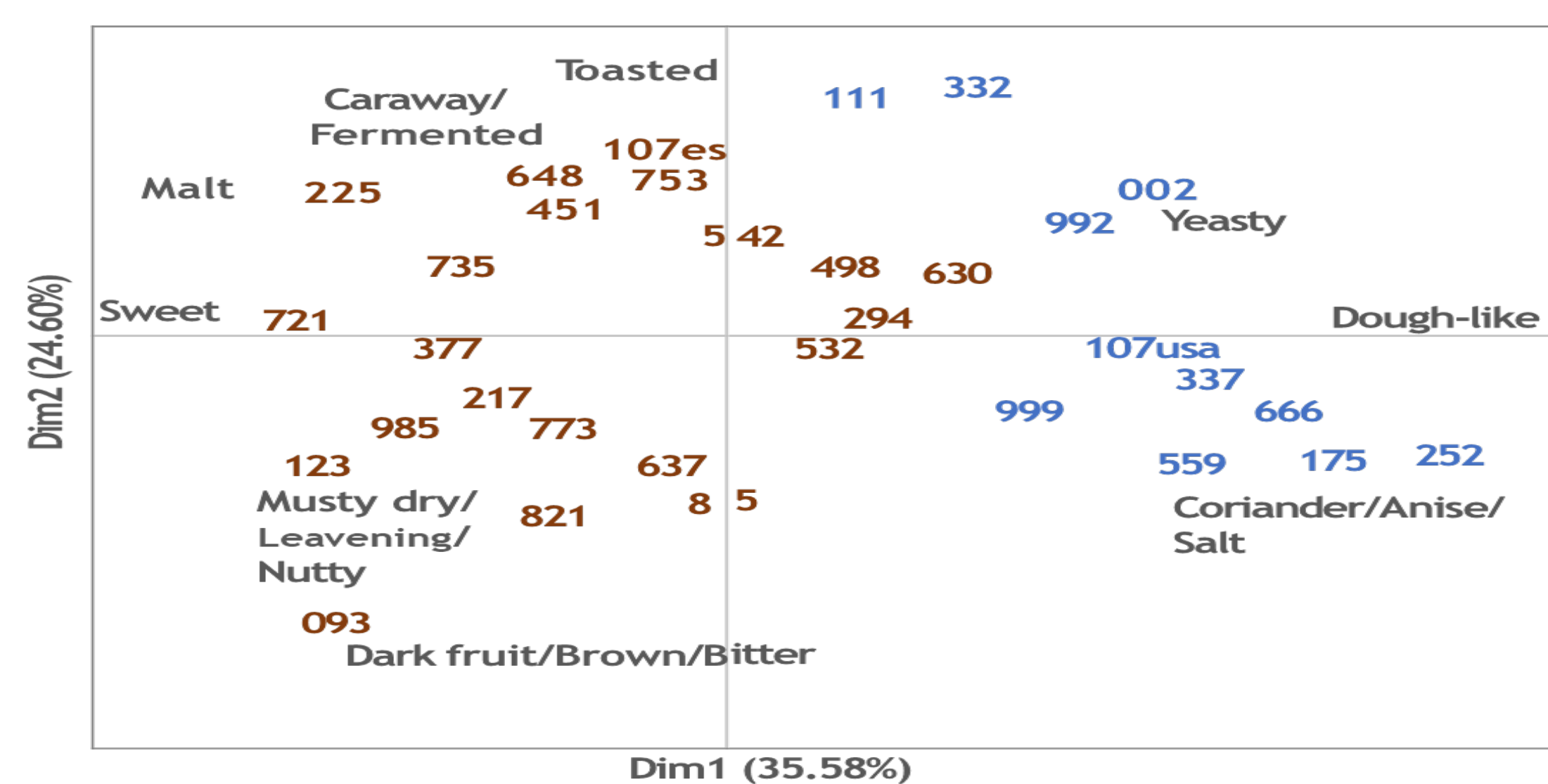

Principal Component Analysis

Biplot (axes F1 and F2: 42.04%)

- US Rye Breads
- Northern European Bread

8 Clusters were identified by Cluster analysis

Cluster 1
High in Dark Chocolate, Dark-fruit, Nutty, Brown, Bitter
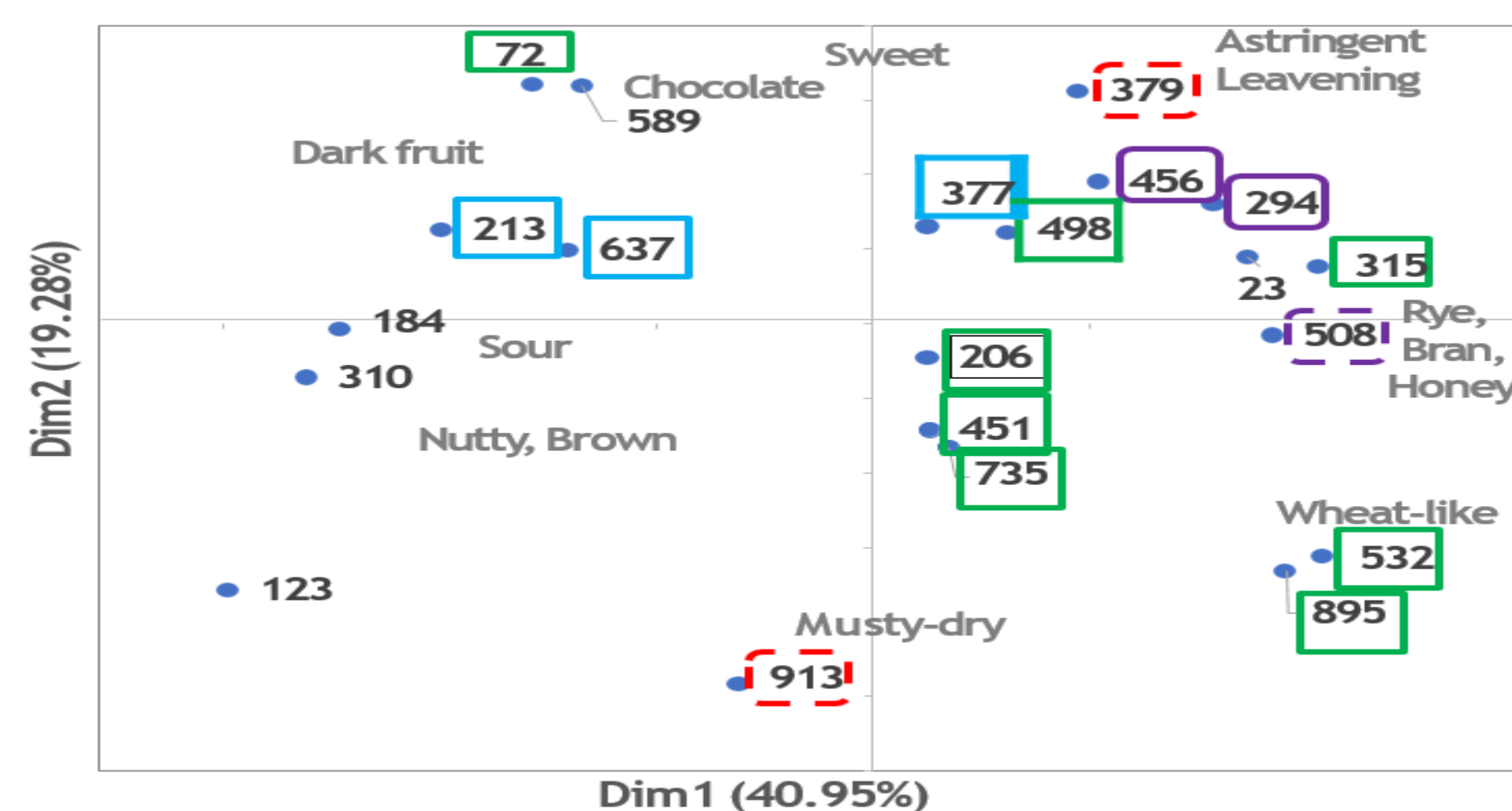
Results/Findings – Napping

Napping – Estonian and US Markets

Estonian and US Breads are highly differentiated

- Estonian breads
- US breads

Napping – Estonian Rye Bread Markets

NO brands cover all four zones in the 'nappe'.
Opportunity for New Product Development!

- Eesti brand breads
- Karja pagar brand breads
- Leibur brand breads
- Fazer brand breads

Conclusion

- The lexicon developed for rye bread had 28 attributes to describe the sensory attributes.
- Napping helped understand the market trend and white spaces.
- Similar research for other product categories needs to be conducted to understand products and their market trends.

References

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