# Consumer Profiling with CATA to Determine Optimal Flavor Attributes for a Product

## Margaret J. Hinds, Sarah V. Kirkmeyer
### Givaudan Flavors Corp., 1199 Edison Drive, Cincinnati, Ohio 45216, USA.   <margaret.hinds@givaudan.com>

## Introduction

The use of consumers for profiling prototypes can facilitate fast-track product development. In the Check-All-That-Apply (CATA) method, consumers typically rate perceived intensities of named attributes.

Objective: To compare two approaches to consumer profiling with CATA for their efficacy to provide guidance to optimize a fruit flavored prototype.

## Materials & Methods

### Products

- Six samples: five flavored products and one prototype – all similar product type and flavor type

### Consumer Profiling

- Group #1 (n=60): used CATA without scales (CATA) – evaluated six samples and rated hypothetical Ideal Product for 32 attributes

- Group #2 (n=60): used CATA with 100-pt intensity line scales (CATA-Intensity) - rated perceived intensities of six samples and hypothetical Ideal Product for 32 attributes

### Data Analysis

- Data were analyzed using Microsoft® Excel and XLSTAT at 95% confidence level.

## Results & Discussion

- Comparison of Givaudan Prototype and Ideal Product: Attribute Elicitation Proportion Differences from CATA method [Binomial Test, p=1/2] showed some similar trends to Attribute Intensity Differences from CATA-Intensity [T-Test] (Fig. 1).

- To determine CATA Attribute Elicitation Proportions, only data from panelists checking an attribute for Givaudan Prototype but not for Ideal (and vice-versa) were used [Meyners et al., Food Quality & Preference , Vol. 30 (2013) pp 309-319].



CATA:  Comparison of Elicitation Proportion Differences of Givaudan Prototype from IDEAL
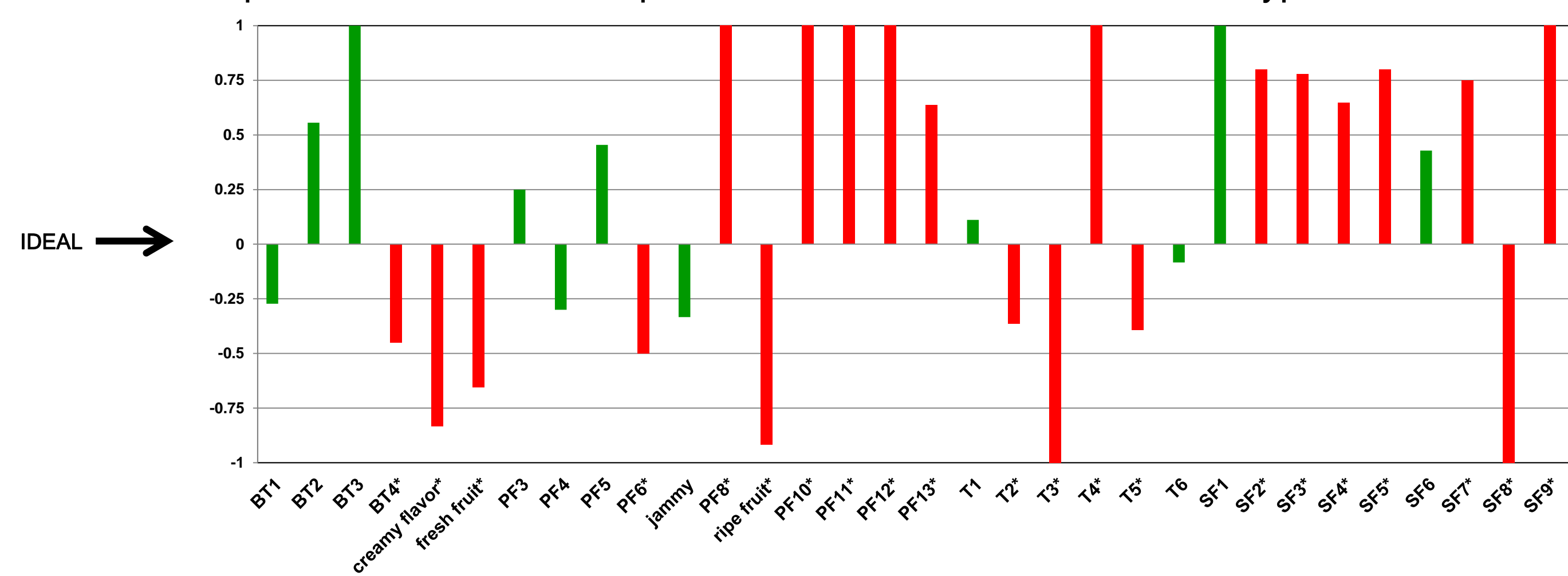
Attribute codes: BT=basic taste, PF=primary flavor, SF=secondary flavor, T=texture.
* denotes significantly different (p≤0.05) Rate (CATA)  or Intensity (CATA-Intensity) from Ideal Product



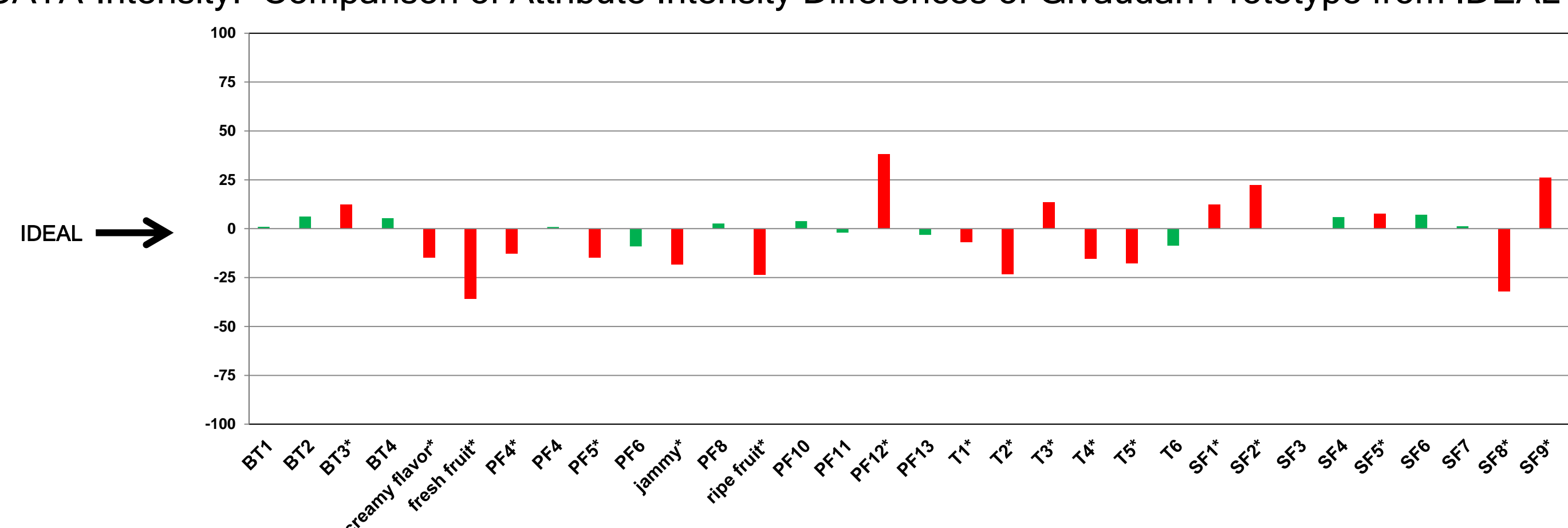CATA-Intensity:  Comparison of Attribute Intensity Differences of Givaudan Prototype from IDEAL

Fig  1 :  Comparison of Givaudan Prototype with Ideal Product

## Results & Discussion

Six Samples and Ideal: Cochran's Q Test and ANOVA of CATA and CATA-Intensity data, respectively, showed similar trends (Fig. 2)
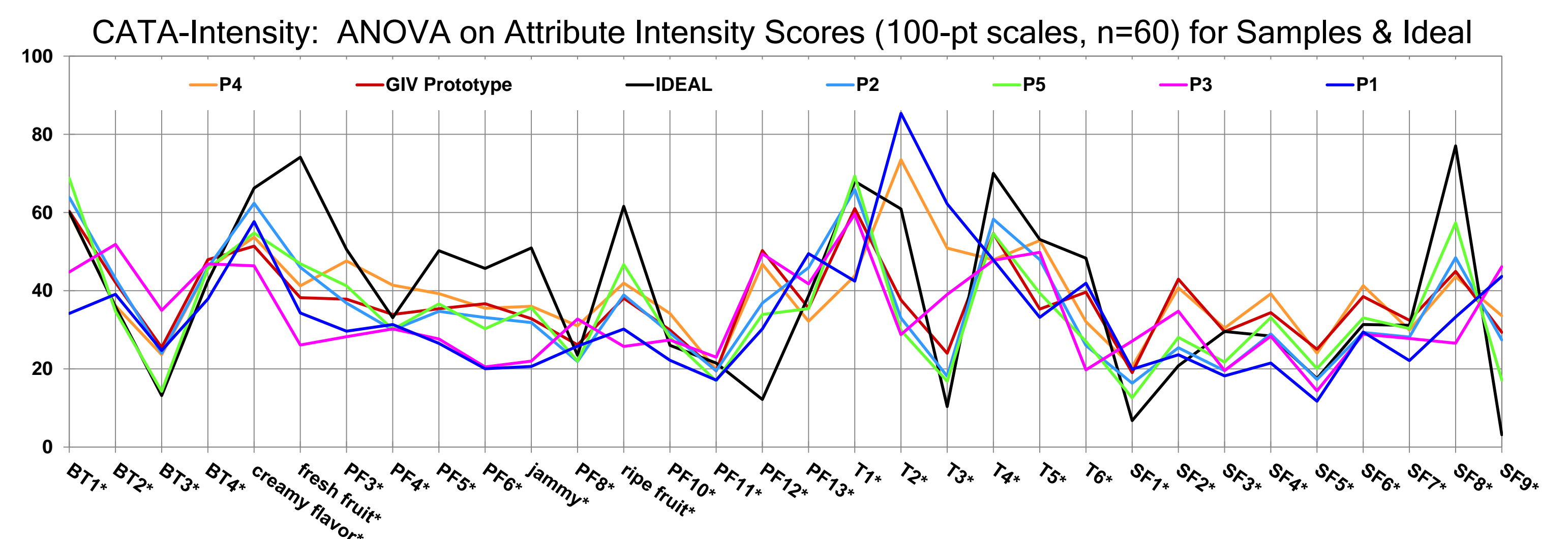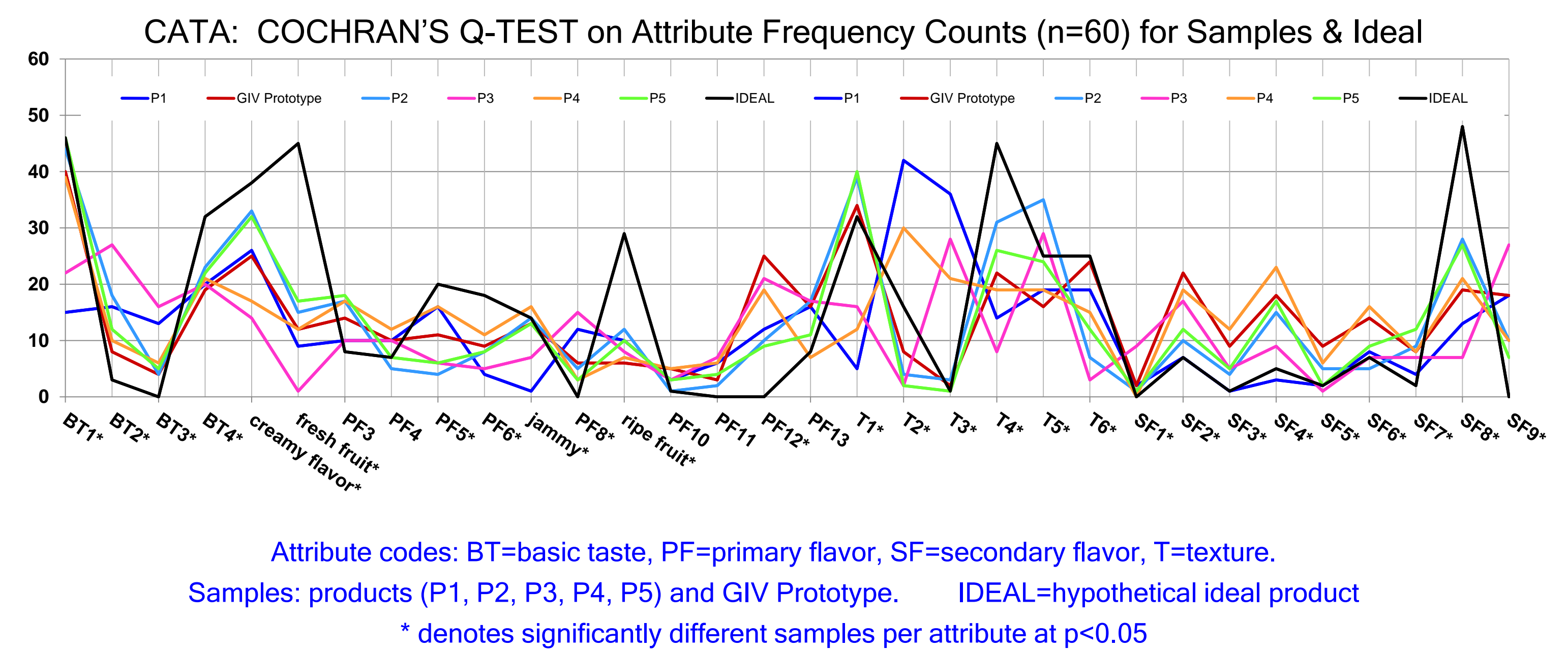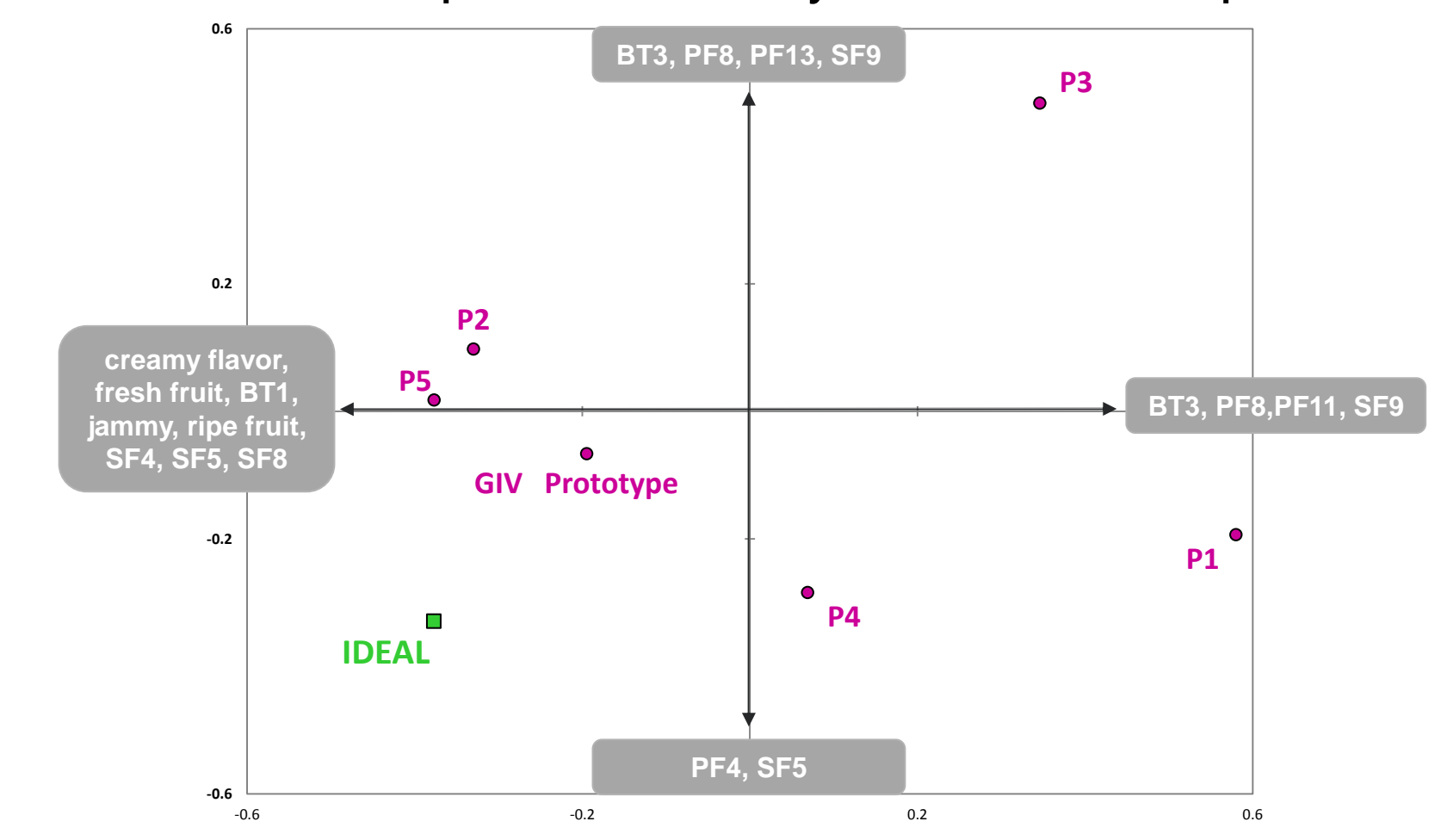


CATA:  COCHRAN'S Q-TEST on Attribute Frequency Counts (n=60) for Samples & Ideal

Attribute codes: BT=basic taste, PF=primary flavor, SF=secondary flavor, T=texture.
Samples: products (P1, P2, P3, P4, P5) and GIV Prototype.      IDEAL=hypothetical ideal product
* denotes significantly different samples per attribute at p<0.05



CATA-Intensity:  ANOVA on Attribute Intensity Scores (100-pt scales, n=60) for Samples & Ideal

Fig 2 : Cochran's Q Test and ANOVA Results

### Six Samples and Ideal: Predictions to Optimize Givaudan Prototype

Correspondence Analysis (CATA) and Principal Component Analysis (CATA-Intensity) showed some similar predictions to bring Givaudan prototype closer to Ideal, e.g., increased intensities of creamy flavor, fresh fruit, and ripe fruit flavors (Fig. 3).



CATA:  Correspondence Analysis Plot for Samples & Ideal



CATA-Intensity:  Principal Component Analysis Plot for Samples & Ideal
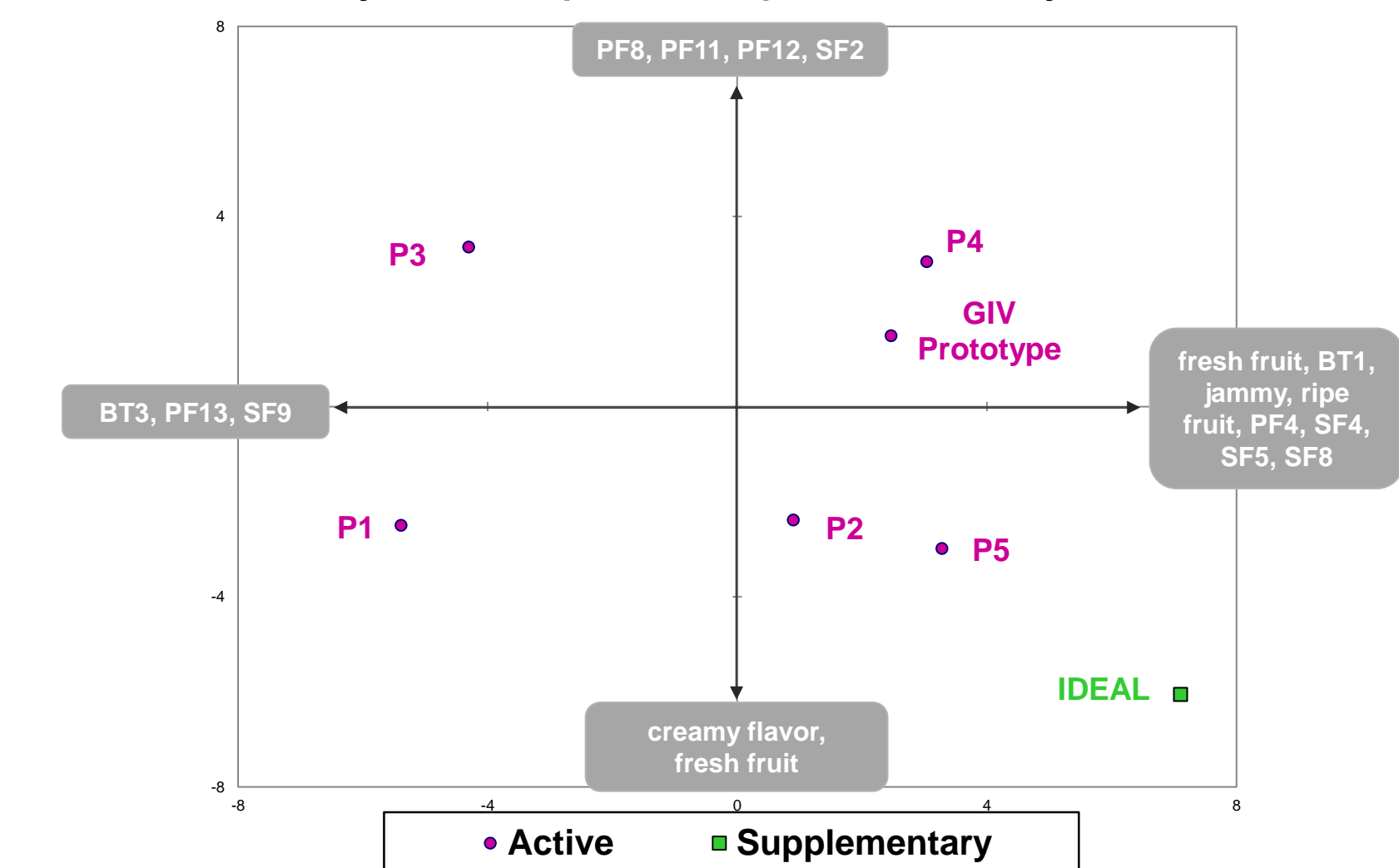
Attribute codes: BT=basic taste, PF=primary flavor, SF=secondary flavor, T=texture.
Samples: products (P1, P2, P3, P4, P5) and GIV Prototype.    IDEAL=hypothetical ideal product

Fig 3:  CATA CA and CATA-Intensity PCA Results

## Conclusion

- The two CATA approaches provided similar fast-track right-direction guidance for prototype optimization.

- CATA (without intensity scales) might be a more practical approach.