Setting up and gaining acceptance of formal sensory procedures in quality control:

SEIZING NEW OPPORTUNITIES

Back to the Future

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www.margareteveritt.com

www.carolraithatha.co.uk

ME | Margaret Everitt Ltd
Specialist in Sensory & Consumer Research

CAROL RAITHATHA LIMITED
Sensory Evaluation
Consumer
Food & Drink
Research Consultancy

Credibility of Sensory Science

Product Development
Widely well established

Satisfying consumer need takes greater precedence in NPD

Commercial demand to optimise sensory attributes grows

User friendly computerised sensory evaluation & analysis programs readily available

Sound set of tools and skills available for sensory QC

Prime opportunity to make progress in Production building links with Development & Marketing

Growing need for tighter control of sensory quality

Production & QC/QA
Still a long way to go

Talk Agenda

- Aims of a QC program
- Defining and communicating sensory quality
- Key issues and possible solutions
- Making the most of the data
- Selling the benefits
- Future opportunities

Main Aims of QC Program

- Individual products as delivered to consumers are fit for purpose
  - Legal requirements
  - Fit & safe for use
  - Nutritional compliance
  - Weight compliance
  - **Sensory quality**

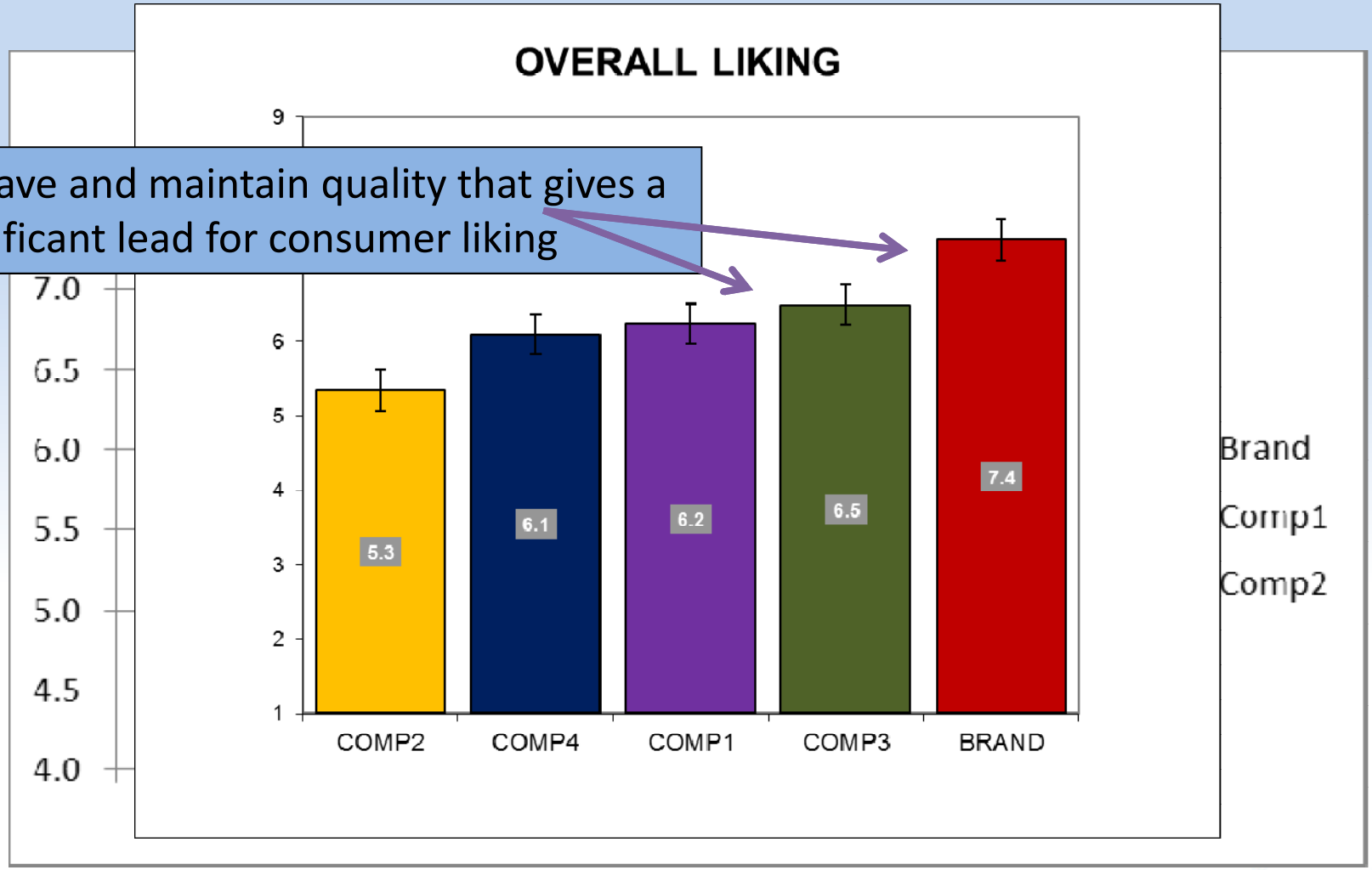
Sensory Quality

- Defining quality through a sensory specification
  - the attributes are the key measurement criteria
- Use consumer liking information from Product Development and Marketing
  - Communication important
  - If this link is missing process can become too subjective
- Goal is to maintain Sensory Quality Margin
  - may be USP

Image Source: Microsoft

Sensory Quality Margin

To have and maintain quality that gives a significant lead for consumer liking



Defining Sensory Quality

External Consumer Focused Approach

Consumer & Sensory Research information ideally from Preference Mapping

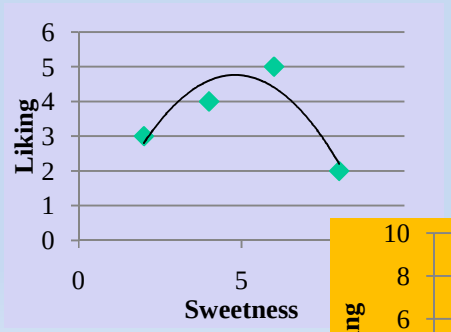
Key preference drivers identified – positive and negative

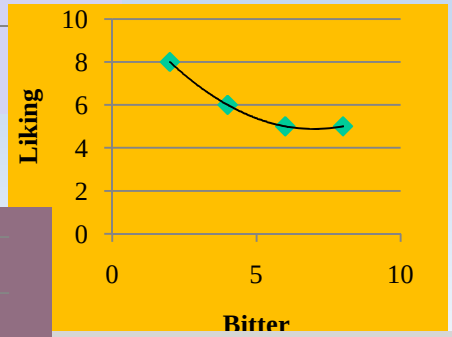
Target product attributes defined with tolerance limits

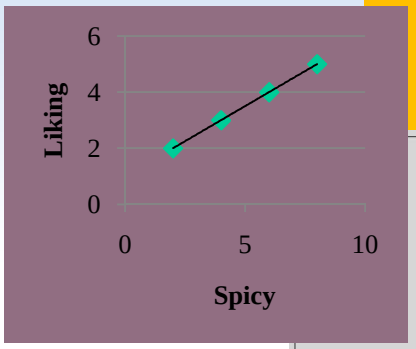
Sensory Specification established

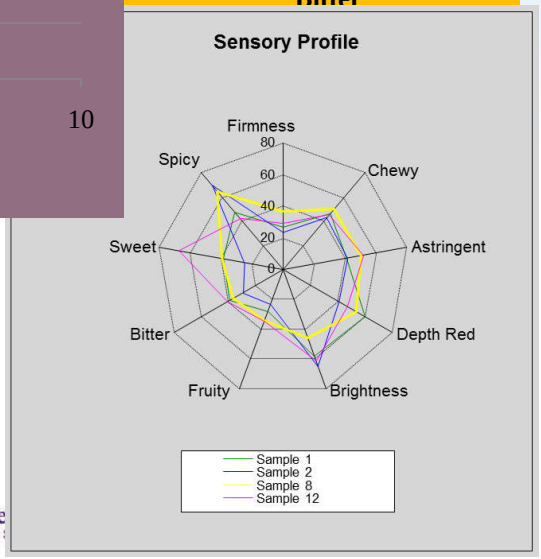
Image Source: Microsoft

Defining Sensory Quality

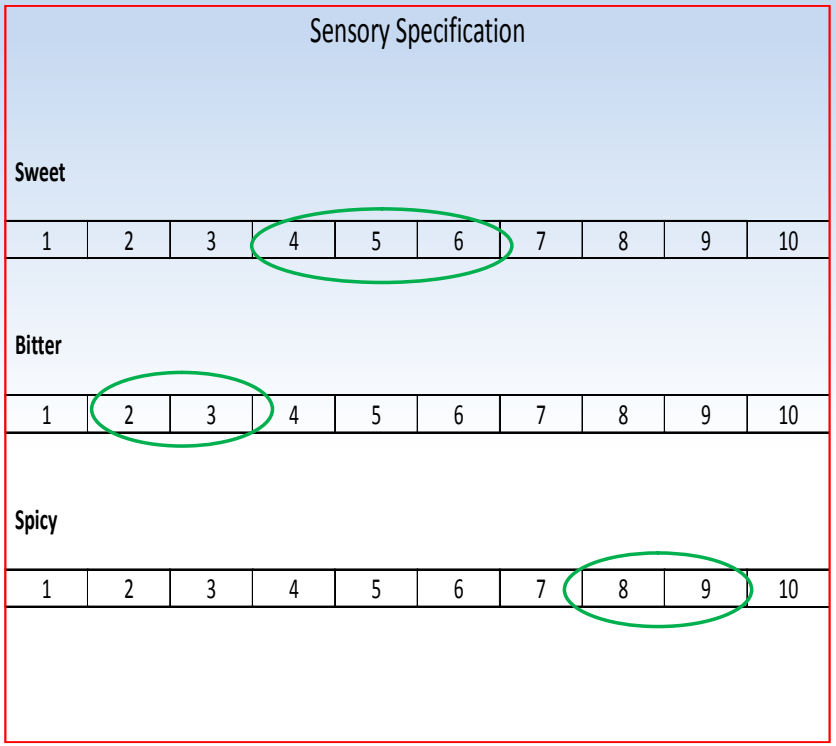








Liking information together with sensory profile data inform the Sensory Specification



Defining Sensory Quality

Manufacturer Focused Approach

Image Source: Microsoft

- Internal cross-functional business team define sensory target
- Based on a combination of market knowledge, product experience and production quality ranges.

Sensory Specification:

Which criteria need to be measured:

Consumer

- Key attributes driving consumer liking

Image Source: Microsoft

Business

- Attributes that relate to important processing stages or factors
- Attributes that relate to critical ingredients
- Likely occurring defects and off-flavours
- Potential Taints

Application of Sensory Specification

- Design of sensory QC system depends on context
- Options:
  - On-line vs. off-line assessments, sampling, physical location of testing, etc.
  - **Sensory methodology**
    - Adapted to context
    - Large range of methods to choose from
      - From profiling to in/out
  - **Assessors**
    - Screened and trained
    - Calibrated and validated against target quality range
  - **Feedback and Actions**

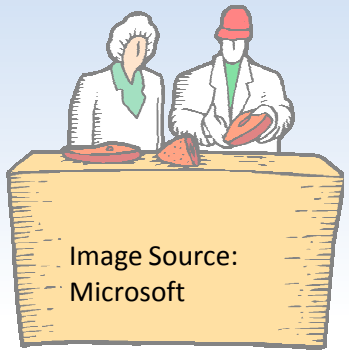


Image Source: Microsoft

Potential Issues

- Lack of commitment from management
  - Commitment is vital to convey and ensure support, interest and respect across a business
  - "Without management support in a typical case the program will amount to nothing more than rubber stamping of supervisory opinion ...." (Lawless H T & Heymann H 1998)

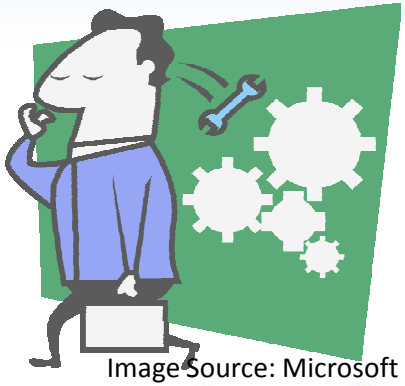


Image Source: Microsoft

Management Commitment

- Likely Concerns
  - Value of Sensory Science
  - Cost v benefits of setting up the system
  - Focus on quality to the detriment of output
  - Detract from other quality initiatives e.g. water conservation; waste reduction
- Tackling Concerns
  - Tailored mini courses or workshops
  - Pilot exercise to illustrate the benefits of establishing a formal sensory QC system

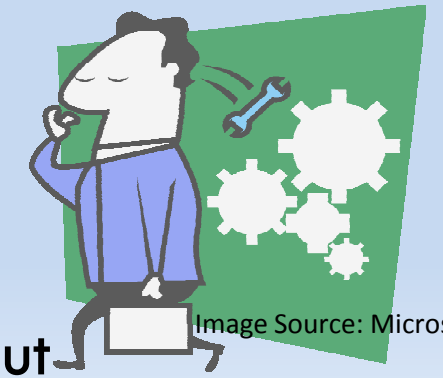


Image Source: Microsoft

Potential Issues

- Lack of an official sensory program co-ordinator
  - Needed to maintain consistency and accuracy of the programs application
- Lack of well defined sensory specifications
  - Encourage use of product development information
  - Ensure the sensory element is not brought in as an after thought
- Specification prone to subjective interpretation
  - Formal training required to achieve objective assessment
  - Calibrate assessors to target quality

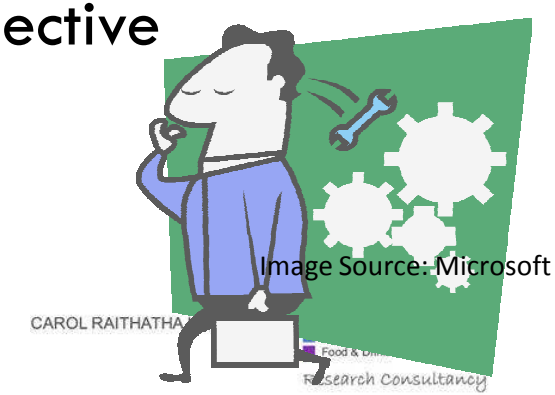


Image Source: Microsoft

Potential Issues

- Lack of formal training of 'assessors'
  - Formal training program required (initial and refresher) to ensure consistency and reliability of assessments
  - Validate proficiency
- Poor use and integration of the sensory information within the production process
  - Procedures need to be designed to facilitate prompt and concise feedback of results and actions both
  - On-line and to the business

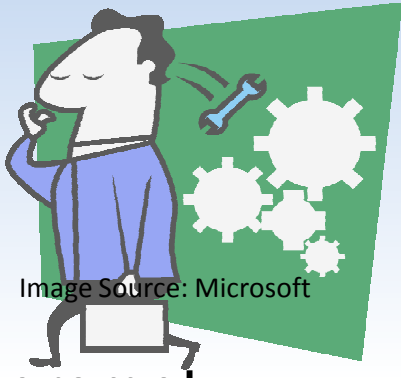


Image Source: Microsoft

Exploit the Data

Individual Assessments

- Feedback needs to be precise and focused to aid corrective action
  - Link back to the relevant process factors and or ingredients needing modification

Over Time

- Trend analysis gives a balanced perspective of the quality deviations
  - Determine ad-hoc versus frequently occurring deviations
  - Identify effects due to other factors e.g. season, manufacturing site, supplier …..
  - Establish 'Sensory' Critical Control Points (SCCP)

Data Collection & Communication

- Paper is most popular on-line; computerised systems off-line
  - Colour codes and graphical charts are popular communication formats

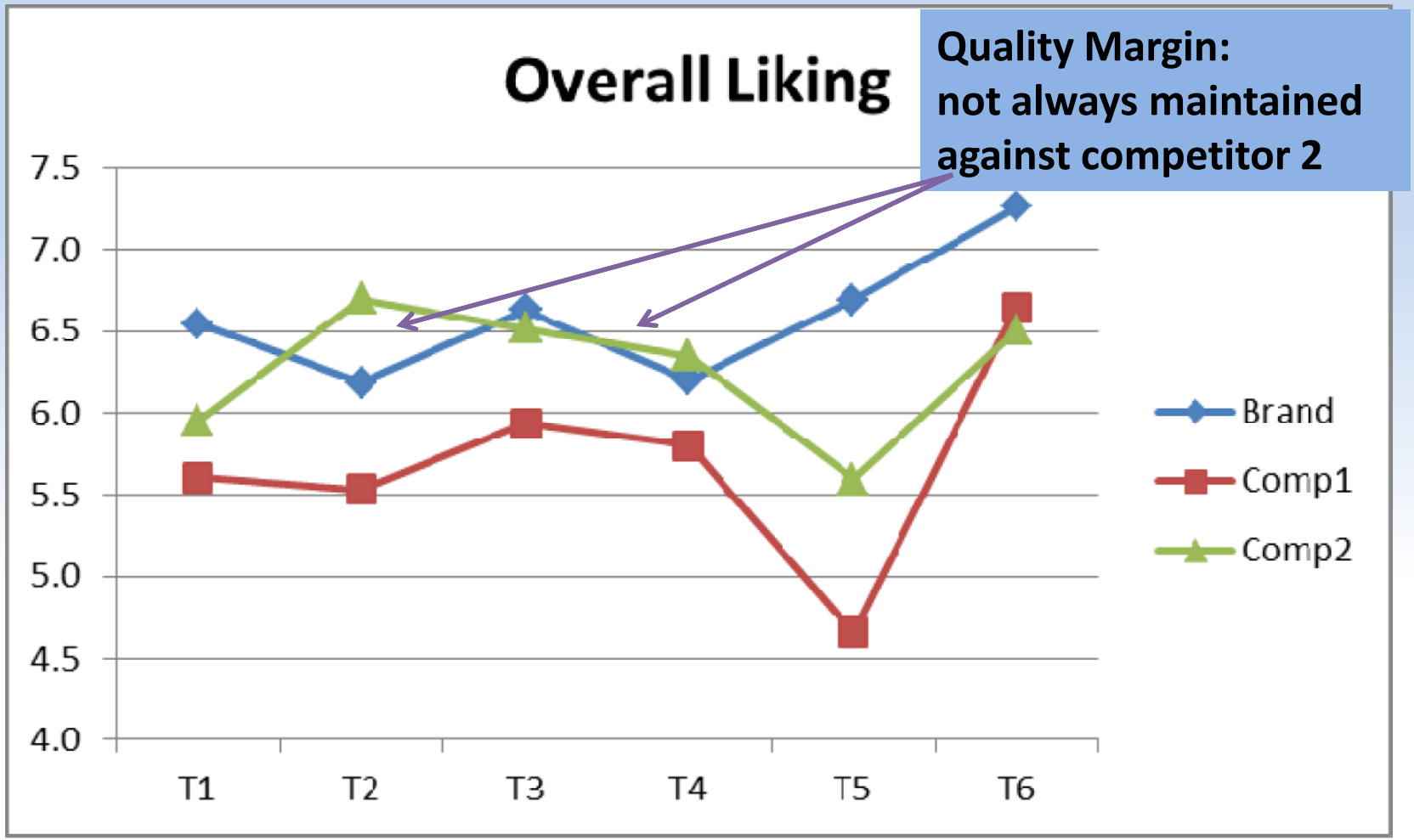
Individual Assessments

Traffic Light 'RAG' colour system adopted by many companies to flag up the quality grades and signal actions

Numerical Category Scale	Descriptor	Action Standard
5	Match with reference sample	No action required
2,6	Slight deviation from ref	Monitor
3,7	Moderate deviation	Take process action. Re-evaluate at increased frequency (1 hr).
2,8	Large deviation	Take process action; Re-evaluate at increased frequency (1 hr); Hold all product produced since the last good check; Held product must be evaluated by a larger trained sensory panel that includes Quality Manager or representative.
1,9	Very large deviation	

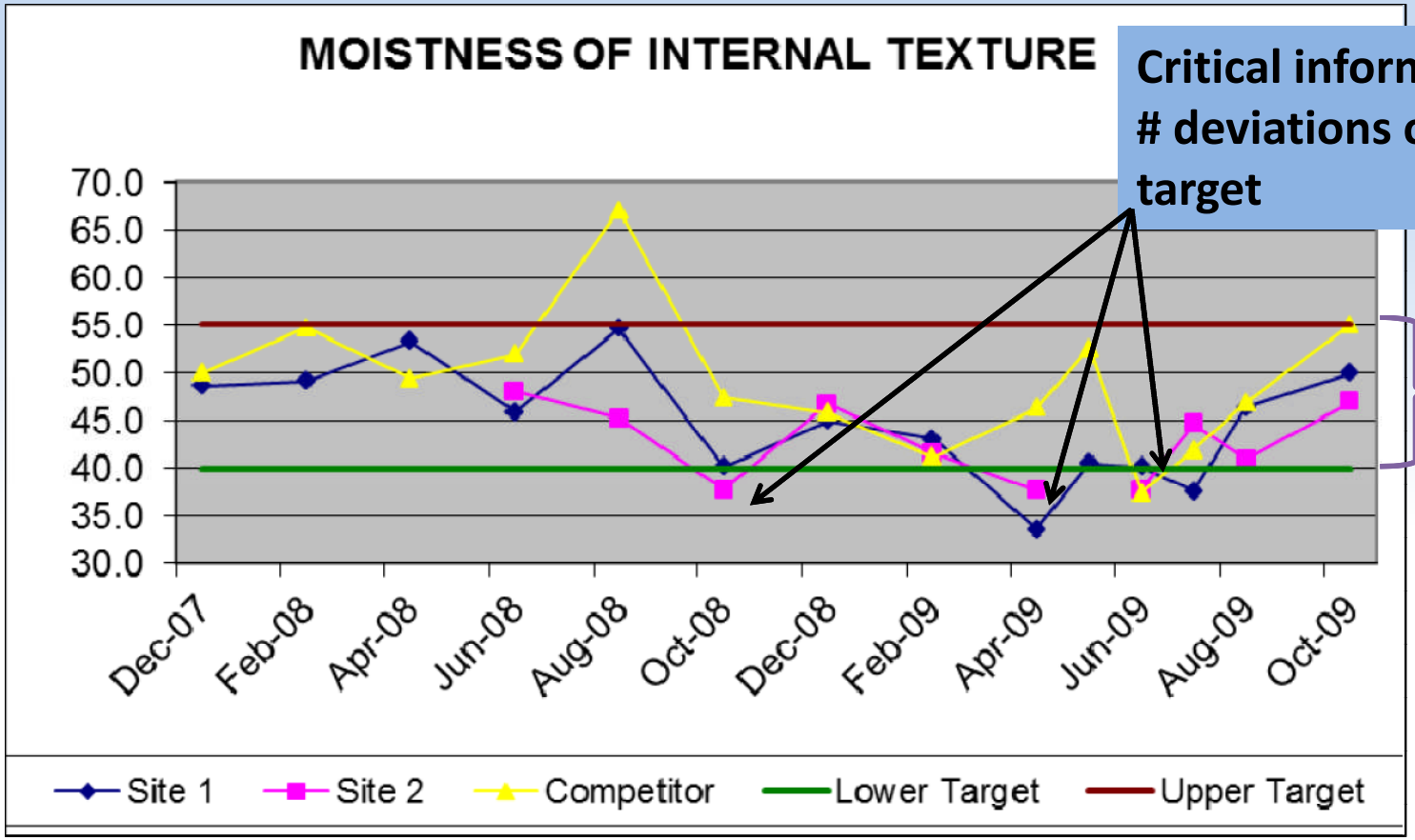
Source: McCain (GB) Ltd

Trend Analysis:
Liking



Trend Analysis: Key Attributes

Trending specific attributes against the target specification range

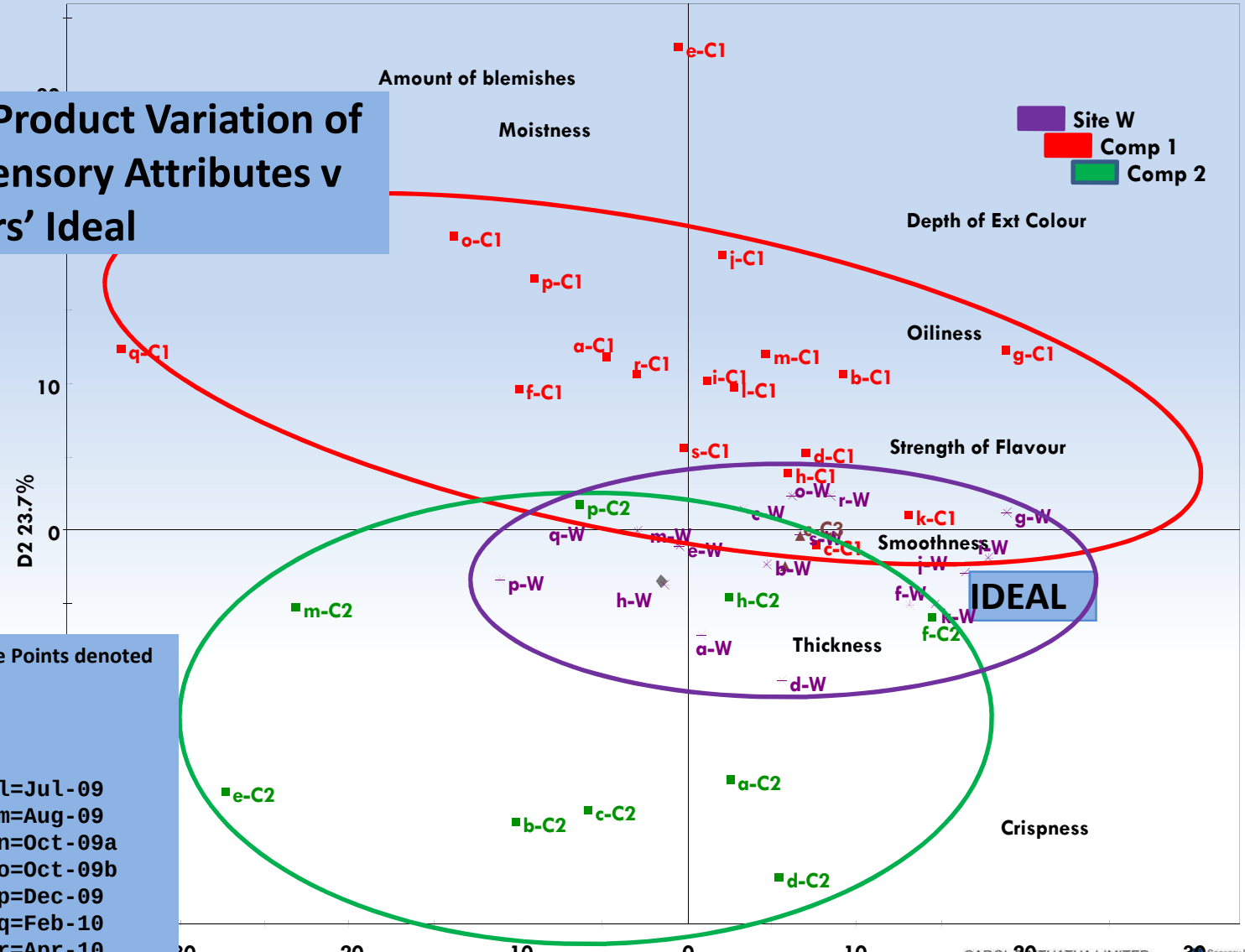


Critical information: # deviations out of target

Target Intensity Range

Trend Analysis

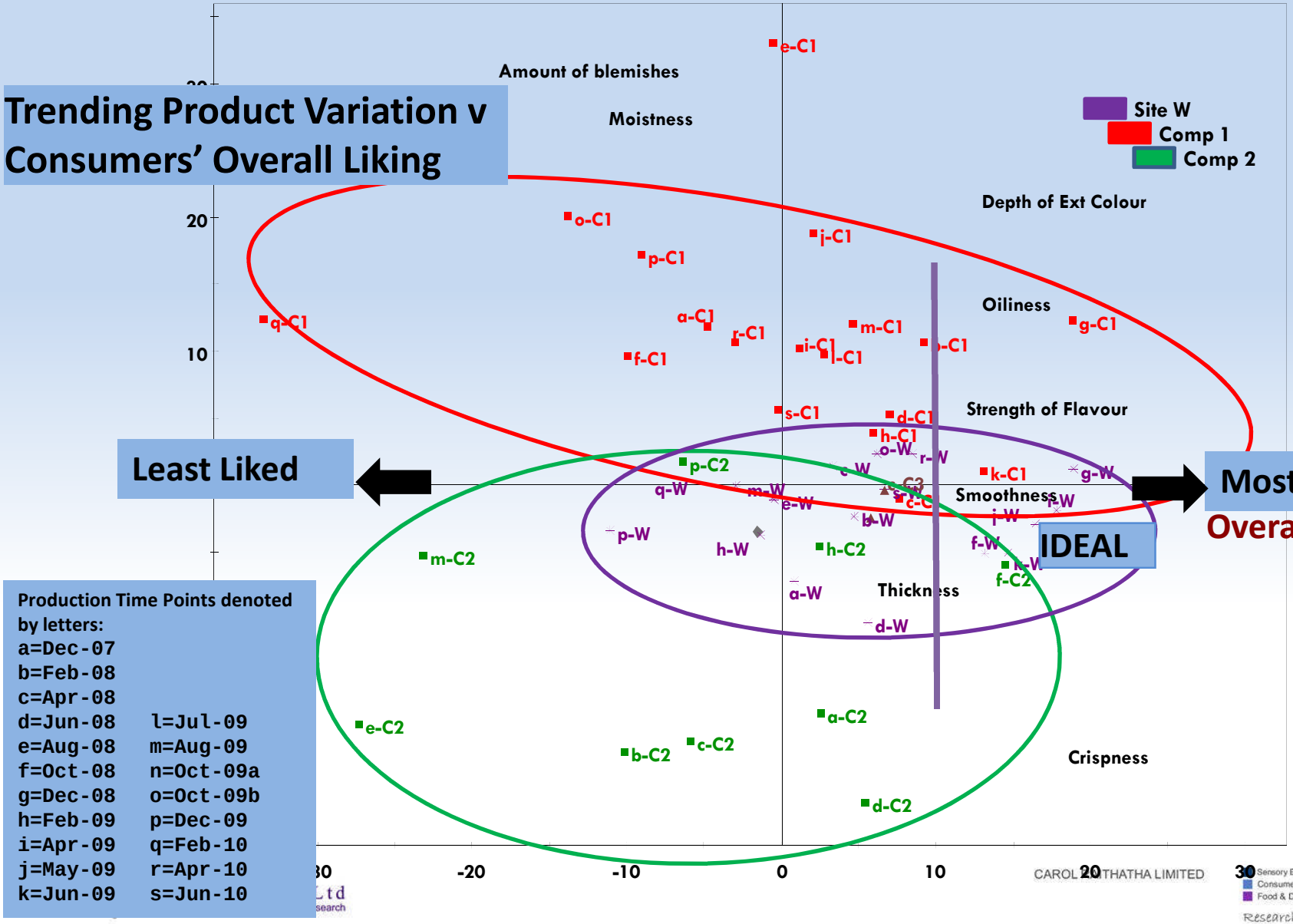
Trending Product Variation of the Key Sensory Attributes v Consumers' Ideal



Production Time Points denoted by letters:

a=Dec-07	
b=Feb-08	
c=Apr-08	
d=Jun-08	l=Jul-09
e=Aug-08	m=Aug-09
f=Oct-08	n=Oct-09a
g=Dec-08	o=Oct-09b
h=Feb-09	p=Dec-09
i=Apr-09	q=Feb-10
j=May-09	r=Apr-10
k=Jun-09	s=Jun-10

Trend Analysis



Selling the Benefits

- Control of Sensory Quality
  - Reduced sensory quality variation
  - avoid development of serious quality issues by detecting early development of off-flavours
  - Efficient trouble-shooting via precise descriptions of quality deviations

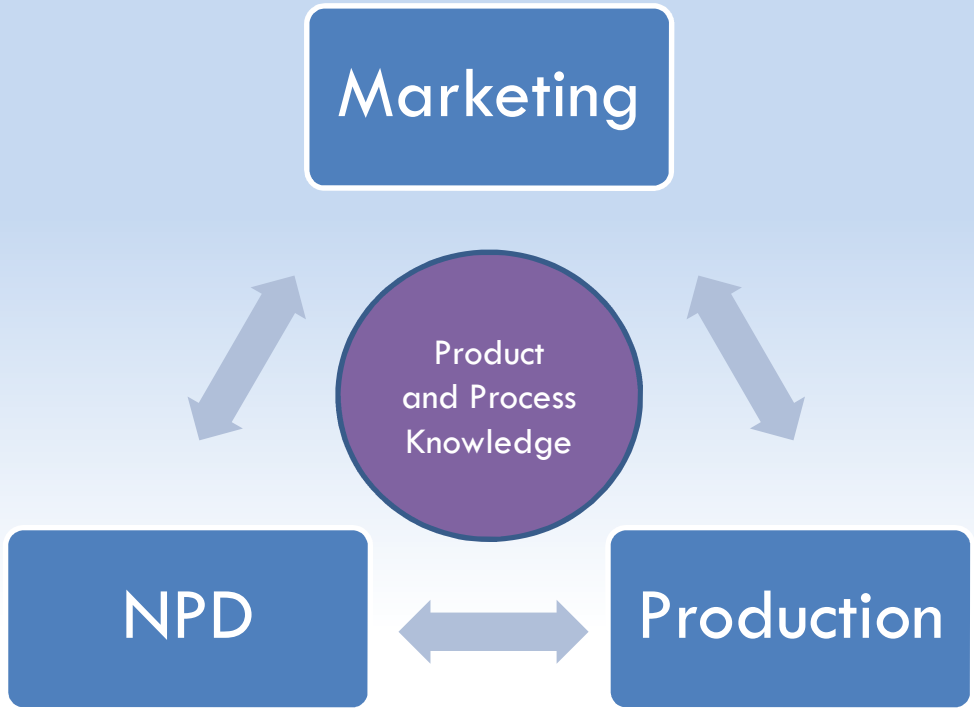
- Brand Equity
  - Maintenance of quality margin over competitors
  - Retain consumer loyalty
  - Maintain brand image

Selling the Benefits

- Aid Production Practices and Efficiency
  - Reduced held, reworked, rejected product
  - Maintain customer contracts
  - Improve product / system knowledge
  - Wider ownership of quality across work force
  - Build on current team working practices e.g. Kaizen

Future Opportunities

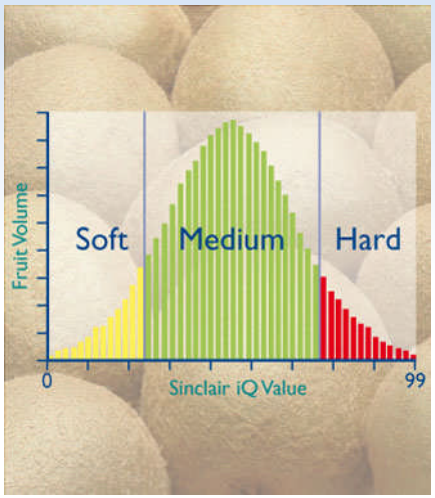
- Sensory can become focus and symbol of total quality culture (everyone can own)
- Sensory QC and QA can become integral tool to improve product and process
- Two-way communications between Production, Product Development and Marketing



Developing contexts – Measurement Automation

- Sensory validation of online quality assessments
  - e.g. fruit packhouse non-destructive testing
    - NIR (sugars, etc.), firmness (e.g. Sinclair IQ), colour, etc.

source: www.sacmi.com



source: www.sinclair-intl.com

Developing contexts – People

- Production automation
  - How to work with factories with only one or two operatives?
- Language
  - multilingual QC staff and global products
- Sensory assessment and job description
  - Should sensory abilities be part of a production or QC operative's recruitment criteria?

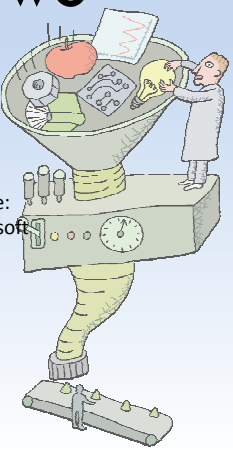


Image Source: Microsoft

Conclusion

- The opportunity is ripe to establish sensory science's credibility in the production environment
- Challenges are many
- But if the framework is strong and clear, new opportunities can be leveraged, and challenges addressed

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- **Qualities of the Sensory Professional: part scientist, part business manager, part human resource expert AND also part visionary with a continual focus on the horizon (Galvin & Waldrop. Food Technology Jan 1990) ..... Now never more so!**