



How to strengthen a traditional apple region in Germany by sensory research in the early stage of breeding

Dr. Martin Kern, Stefanie Rutz (SAM Sensory and Marketing International) & Prof. Dr. Ulrich Enneking, Prof. Dr. Werner Dierend, Kirsten Stallmann (University of Applied Sciences Osnabrück)

BACKGROUND: → Decreasing diversification of the apple market, lack of highly accepted varieties
→ Impulse needed for traditional apple region „Altes Land“ - changing climate conditions: Aim for regional & varietal authenticity and orchard adaption

OBJECTIVES: → Integrate consumer preferences in breeding procedure
→ Increase efficiency and market potential of breeding efforts

APPROACH: → 3-Partner-Cooperation for extensive sensory and consumer research project

ZIN
Züchtungsinitiative Niederelbe
Breeding Initiative Niederelbe

- Initiative for New Varieties
- Breeding

Fachhochschule Osnabrück
University of Applied Science
Osnabrück

- Coordinative Partner & Scientific Consulting
- Acceptance Measurement & Evaluation

sam
SAM Sensory and Marketing
International

- Consulting Consumer Research
- Sensory Profiling & Evaluation

The Apple Breeding Procedure

Sensory & Consumer Research



2003 Crossing & pollination

- controlled crossing of selected varieties
- Specific crossing design
- 2000-3000 seedlings grow up each year

2007 1. Selection level

- Objective:** Identification of most interesting apple out of 10'000 varieties (one tree each)
- Field-Evaluation:** e.g. appearance, size of the apples > 80mm
- Apple-Evaluation:** Done after harvest, e.g. sugar and acid content, sensory.

2009 2. Selection level

- Objective:** Selection of about 10% of the best apple varieties of the first level
- 54 crossing-results reach this level (ten trees each variety)

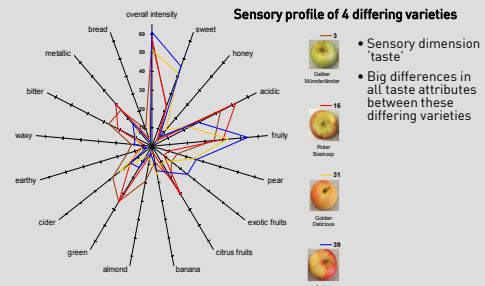
3. Selection level

- Objective:** Selection of 2-3 most interesting and promising crossings
- Plantation of 100 trees per crossing similar to common practice

Market launch

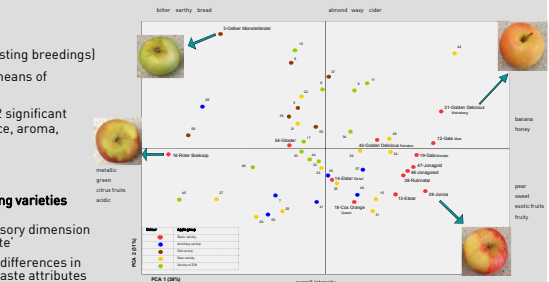
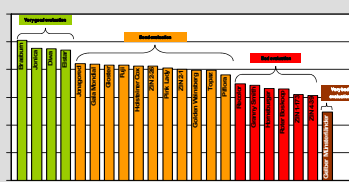
1st step – Descriptive Panel

- 51 apple varieties have been selected for the study (new & existing breedings)
- 11 trained consumers profiled 51 different apple varieties by means of quantitative descriptive analyses (QDA)
- Sensory profiling and Mapping of the 51 apple varieties with 82 significant discriminating attributes in the sensory dimensions appearance, aroma, taste, mouthfeel, aftertaste and after-sensation



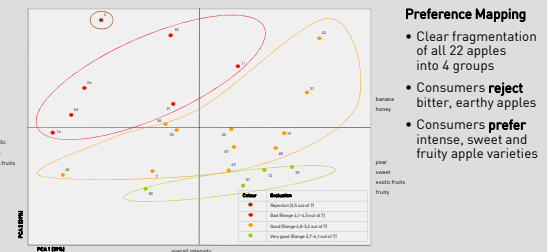
2nd step – Consumer Test

- 354 consumers tasted 6 out of the 22 differing apple varieties



3rd step – Combination of objective panel data and hedonic consumer evaluation

- Result:** most important and relevant criteria for consumer preferences among different apple varieties



MAIN FINDINGS:

- Sensory & consumer research showed to be a valuable tool for breeding process
- Selecting the right variety: faster time to market, higher consumer loyalty

SAM Sensory and Marketing International GmbH
Oetztaler Strasse 1
D - 81373 München
Phone: +49 89 743 767 0
Fax: +49 89 769 696 3
info-d@samresearch.com
www.samresearch.com



SAM Sensory and Marketing International – Branch France
16, rue Martel
75010 Paris - France
Phone: + 33 1 48 24 61 00
Fax: + 33 1 48 24 61 10
info-fr@samresearch.com

SAM Sensory and Marketing International – Branch Italy
Viale Monza, 270
I - 20128 Milano
Phone: + 39 02 27 00 70 19
Fax: + 39 02 27 00 10 97
info-it@samresearch.com

SAM Sensory and Marketing International – Branch Zurich
Albulastrasse 57
CH - 8048 Zürich
Phone: + 41 44 439 70 40
Fax: + 41 44 439 70 41
info-ch@samresearch.com