Introduction
Checking Panel Performance: Why?

Per Lea

Nofima Food

(Formerly Matforsk – Norw. Food Res. Inst.)

What's so special about sensory data?

- No *truth*

- Subjective – yet objective

- Distinction between <u>hedonic</u> and <u>descriptive</u>
    - <u>Hedonic:</u> How good is this sample? 1 2 3 **4** 5
    - <u>Descriptive:</u> Sweetness of sample is 6.7

- Hedonic
    - Interested in a population. Representative consumers

- Descriptive
    - Panel seen as an instrument
        - Whiteness (Physical definition(s) available)
        - Chewing resistance (Closely related: Warner Bratzler)
        - Flavour/odour intensity (Probably no instrument available)
        - Sweetness as perceived by humans is not necessarily the same as chemically measured sucrose (Miraculin!)

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(Slides added 22 July)

- Feature article, March or April 2007

- Per Lea's First Law on Consumer Testing

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Per Lea's First Law on Consumer Testing

- ## Consumers are liars!

Per Lea's First Law on Consumer Testing

• Consumers are liars!

- Not <u>all</u> consumers <u>all</u> the time, but even worse:
- <u>Some</u> of the consumers <u>some</u> of the time

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Trend in sensory
(and chemical, microbiological, physical,…) analysis

- <u>Watching</u> a phenomenon
- <u>Identifying</u> a (chemical, physical....) process
- <u>Measuring</u> a substance
- <u>Improving</u> measurements

- <u>Validation</u>
  - How good are our methods?
  - How good are our results?
  - Quality control

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Simple checklist
The stone-age of panel checking
No specialist software necessary

- Source: Nofima Food's accreditation contract
    1. Import data into relevant statistical software
    2. Number of observations OK?
       (Balanced design: N=Panellists × Samples × Replicates)
    3. Print Min/Max for each variable in file
       (All values within legal range?)
    4. Print frequency distribution of design variables (Panellists, Samples, Replicates)
    5. Sort data by Panellist – Sample – Replicate (for informal manual check of replicates, feedback to assessors)
    6. Store data in Excel file to be used by PanelCheck
    7. Send results (2.-5.) to panel leader

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Prosjekt	Ansv.	1	2	3	4	5	6	Sign.
O-7623 Eplex	LBL	12-11-97	12-11-97	12-11-97	12-11-97	12-11-97	12-11-97	Lta
O-7347 Leverpostei	LBL	12-11-97	12-11-97	12-11-97	12-11-97	12-11-97	12-11-97	Lta
B-9704 F Loff	IJFj	12-11-97	13-11-97	13-11-97	13-11-97	13-11-97	13-11-97	Lta
1-2216 Intercoll.	LBL	16-11-97	17-11-97	17-11-97	17-11-97	17-11-97	17-11-97	Lta
B-9707 TP Leverpostei	LBL	23-11-97	23-11-97	23-11-97	23-11-97	23-11-97	23-11-97	Lta
B-9711 Kylling	IJFj	28-11-97	(49)					
B-9714 Kylling	IJFj	28-11-97	28-11-97	28-11-97	28-11-97	28-11-97	28-11-97	Lta
O-7665 Havregryn	LBL	11-12-97	11-12-97	11-12-97	11-12-97	11-12-97	11-12-97	Lta
O-7663 Leverpostei	IJFj	7-1-98	8-1-98	8-1-98	8-1-98	8-1-98	8-1-98	Lta
I-2216 Grunnsmak	LBL	27-1-98	(50)					
I-2216 Grunnsmak	LBL	27-1-98	27-1-98	27-1-98	27-1-98	27-1-98	27-1-98	Lta
G-2671 Leverpostei	LBL	27-1-98	27-1-98	27-1-98	27-1-98	27-1-98	27-1-98	Lta
B-9707 Olje	IJFj	28-1-98	28-1-98	28-1-98	28-1-98	28-1-98	28-1-98	Lta
B-9707 Olje, rettede data	IJFj	30-1-98	30-1-98	30-1-98	30-1-98	30-1-98	2-2-98	Lta
O-7712 Spaghytte	LBL	6-2-98	9-2-98	9-2-98	9-2-98	9-2-98	9-2-98	Lta
B-9510 Svineham 6mm	IJFj	10-2-98	10-2-98	10-2-98	10-2-98	10-2-98	10-2-98	Lta
B-9702-F5 Storfe	LBL	18-2-98	19-2-98	19-2-98	19-2-98	19-2-98	20-2-98	Lta
B-9702-F4 Ytrefilet	IJFj	19-2-98	20-2-98	20-2-98	20-2-98	20-2-98	20-2-98	Lta
B-9702-FF Lartunge	IJFj	26-2-98	26-2-98	26-2-98	26-2-98	26-2-98	26-2-98	Lta

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Number	49
Problem	40 redundant samples
Solution	One session included twice
Action	Session deleted 28/11-1997

Number	50
Problem	Missing data from assessors 1 and 11
Solution	Enter data manually
Action	Data file corrected 27/1-1998

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2: Checking N
3: Checking Min/Max

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Descriptive Statistics
Variable          N        Mean          SD      Minimum     Maximum
Session          64      1.0000      0.0000       1.0000      1.0000
Assessor         64      7.6250      4.5057       2.0000      15.000
Umami            64      0.4500      0.3381       0.0000      0.9000
Rep              64      1.5000      0.5040       1.0000      2.0000
Code             64      488.13      263.01       221.00      904.00
S1               64      5.9438      0.9643       3.8000      8.1000
S2               64      2.9734      1.6113       1.0000      6.3000
S3               64      3.3062      0.9734       1.5000      6.0000
S4               64      4.7750      0.8650       2.3000      6.4000
S5               64      3.2484      1.1078       1.4000      5.8000
S6               64      2.9328      1.8106       1.0000      6.4000
S7               64      3.2641      0.9408       1.0000      5.2000
S8               64      1.6750      0.8104       1.0000      3.6000
S9               64      1.0375      0.2020       1.0000      2.2000
S10              64      3.9516      1.3575       1.0000      6.4000
S11              64      1.1203      0.3925       1.0000      2.8000
S12              64      3.9156      1.0979       1.8000      5.9000
S13              64      4.9172      0.8935       2.8000      6.9000
S14              64      2.8922      1.1474       1.0000      5.0000
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4: Frequency distribution of design variables

Frequency Distribution of Umami

Value	Freq	Percent	Cumulative Freq	Cumulative Percent
0.00000	16	25.0	16	25.0
0.30000	16	25.0	32	50.0
0.60000	16	25.0	48	75.0
0.90000	16	25.0	64	100.0
Total	64	100.0		

Frequency Distribution of Rep

Value	Freq	Percent	Cumulative Freq	Cumulative Percent
1	32	50.0	32	50.0
2	32	50.0	64	100.0
Total	64	100.0		

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5: Sort data by Panellist – Sample – Replicate

A	U	R	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
2	0.0	1	5.6	1.0	3.7	3.3	2.6	2.6	1.0	3.6	1.0	2.0	1.0	4.3	2.8	4.7
2	0.0	2	5.9	1.0	3.5	3.2	2.9	1.0	2.3	1.0	1.0	2.6	1.0	4.3	2.8	3.8
2	0.3	1	7.2	1.0	2.8	5.5	2.7	5.0	2.7	1.0	1.0	3.8	1.0	3.1	5.2	2.2
2	0.3	2	7.3	1.0	3.0	6.1	4.2	6.4	2.8	1.0	1.0	4.5	1.0	2.7	5.5	2.8
2	0.6	1	7.6	1.0	2.8	5.7	3.6	6.0	2.7	1.0	1.0	4.2	1.0	1.9	4.3	2.9
2	0.6	2	7.5	1.0	2.8	5.6	3.8	6.0	2.9	1.0	1.0	4.8	1.0	2.3	5.1	2.6
2	0.9	1	7.1	1.0	2.8	4.8	3.4	6.0	3.0	1.0	1.0	3.2	1.0	1.8	5.4	2.1
2	0.9	2	8.1	1.0	2.2	6.0	3.7	6.3	2.7	1.0	1.0	4.3	1.0	2.4	6.2	2.8
3	0.0	1	6.0	3.2	2.5	5.6	2.5	1.0	2.1	2.2	1.0	5.6	1.0	5.0	5.0	4.2
3	0.0	2	6.8	4.9	3.0	4.1	1.9	3.5	2.5	3.4	1.0	5.5	1.0	5.5	5.5	4.2
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15	0.6	2	4.6	3.8	3.0	3.9	4.5	1.0	3.0	3.0	1.0	2.5	1.0	3.9	3.1	2.3
15	0.9	1	5.2	5.0	3.2	4.9	5.0	1.9	3.9	1.0	1.0	4.3	1.0	4.0	4.6	2.1
15	0.9	2	6.0	5.0	3.7	5.0	4.6	2.9	4.7	1.0	1.0	4.1	1.8	4.7	5.1	2.4

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What is a good panel?
What is a good assessor?

- Good panel
  - Can repeat itself
  - Selective (finds differences if present)
  - Scores well in collaborative tests

- Good assessor
  - Can repeat her(him)self
  - Selective (finds differences if present)
  - Recognize basic tastes

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Workshop organised by

P L
Sébastien Lê
r Lêa

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Programme

- Chris Crocker: Measuring discrimination in sensory panel data

- Per Lea: Checking panel performance: How?

- Thierry Worch, Raymond Delcher: Panel monitoring and tracking

- Dongsheng Bu: Quali-Sense

- Pascal Schlich: Panel performance with Sensobase

- Sébastien Lê: Demonstration of SensoMineR and panel performance functions

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Types of panels & panellists

- Specialist panel
  - Quality control in the food industry

- General panel
  - Research institutes

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Advice from Nofima Food (Matforsk)

- Use <u>outside panellists</u> (exclusively). Employed as <u>panellists</u>
  - Not:
    - Any lab technician or secretary that might be available
    - Students

- Commitment
  - Not:
    - "I'll come if I have the time"
    - "I'll come if we're tasting an interesting product"
    - "Rancid oil? No, thanks" / "Beer tomorrow? Yesssir!"

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