Food Labelling to Advance Better Education for Life
Major results and conclusions

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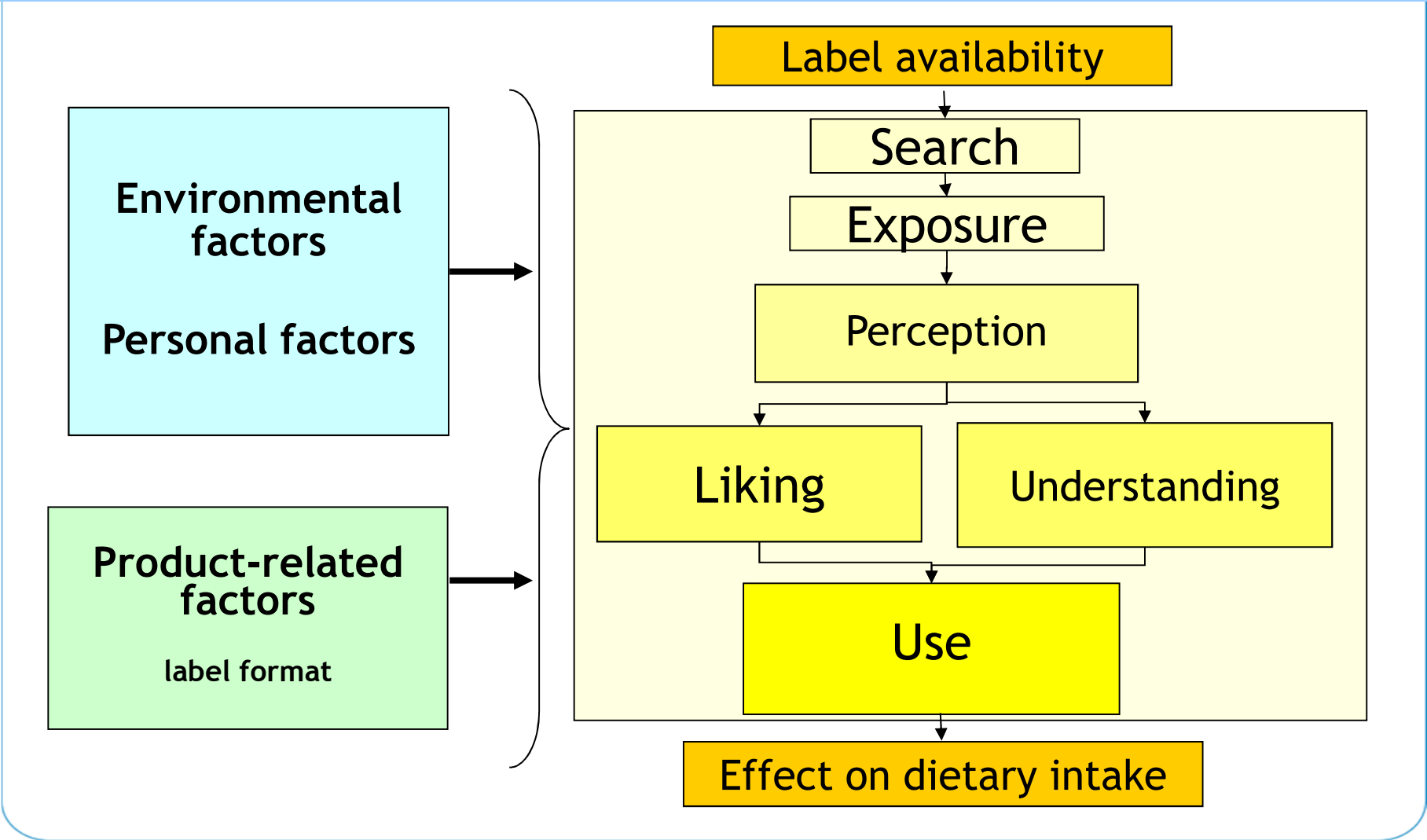
on behalf of the FLABEL consortium

Overall objectives

- To determine how nutrition information on food labels can affect dietary choices, consumer habits and food-related health issues by developing and applying an interpretation framework incorporating both the label and other factors/influences.

- To develop guidelines on use of nutrition information on food labels for EU policy and the food industry, especially SMEs, including recommendations for assessing the impact of ongoing and future legislative and voluntary food labelling schemes.
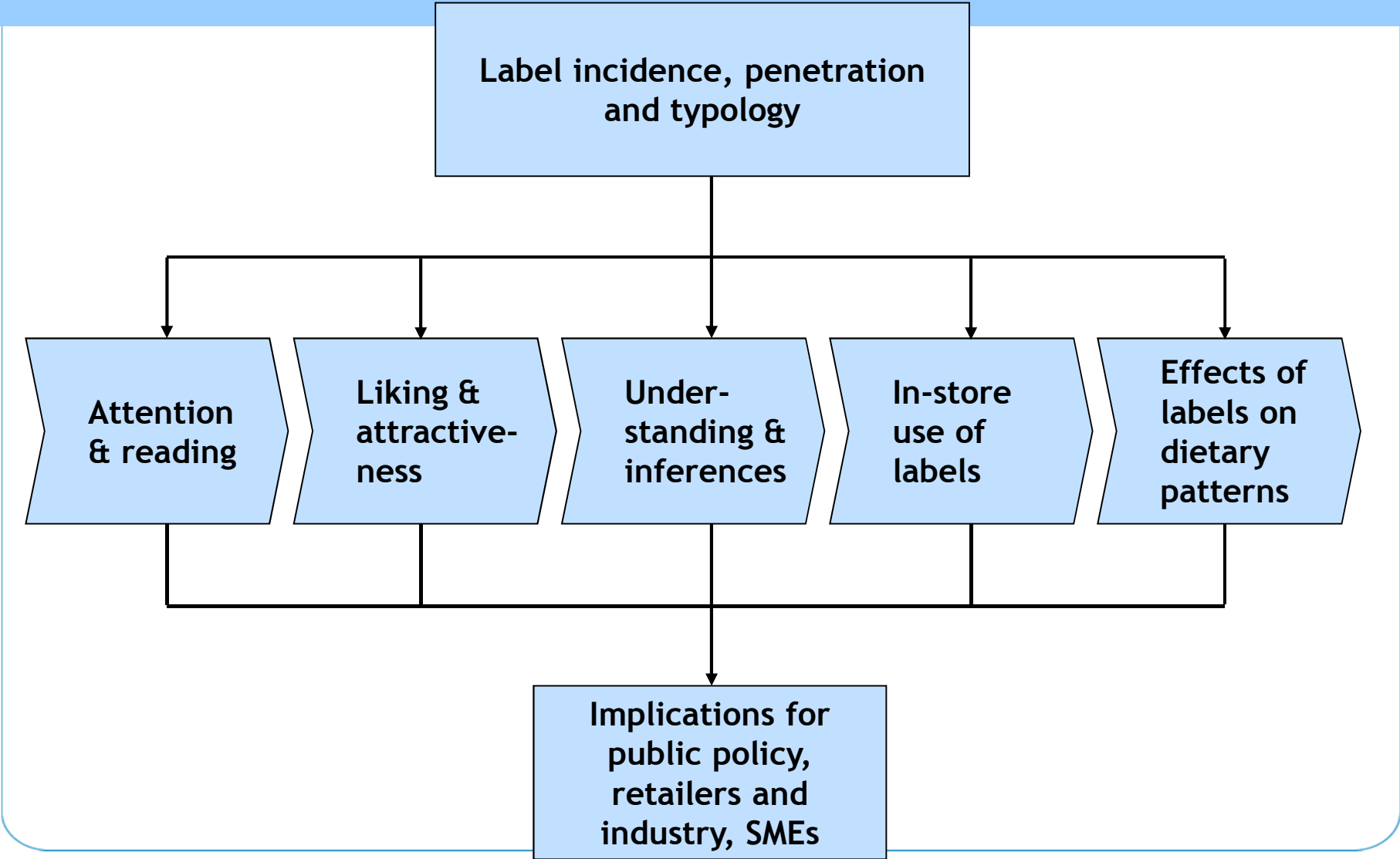
Consortium

- European Food Information Council – EUFIC, BE/EU (Coordinator)
- Aarhus University, DK
- Agricultural University of Athens, GR
- Dokuz Eylul University, TK
- Saarland University, DE
- University of Surrey, UK
- University of Warsaw, PL
- Wageningen University, NL
- Georg-August University Göttingen, DE
- Tesco Stores Ltd, UK
- Confederation of Family Organisations in the European Union (COFACE)
- European Association of Craft, Small and Medium-sized Enterprises (UEAPME), BE/EU
- European Community of Consumer Cooperatives (Euro Coop), BE/EU

Conceptual framework

Environmental factors

Personal factors

Product-related factors

label format

Label availability

Search

Exposure

Perception

Liking

Understanding

Use

Effect on dietary intake

FLABEL work flow overview

Label incidence, penetration and typology

Attention & reading

Liking & attractive-ness

Under-standing & inferences

In-store use of labels

Effects of labels on dietary patterns

Implications for public policy, retailers and industry, SMEs

Creating a benchmark - Incidence, penetration and typology of nutrition labels

Leader: EUFIC

Incidence and penetration – methodology

- 27 EU countries plus Turkey

- 3 retailers per country

  - Top 5, consumer cooperative/national, discounter

- Physical audit of all products in 5 product categories

  - sweet biscuits

  - breakfast cereals

  - pre-packed fresh ready meals

  - carbonated soft drinks

  - yoghurts

Nutrition information across 5 categories
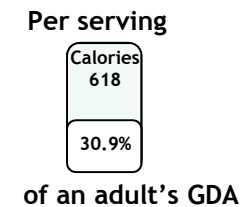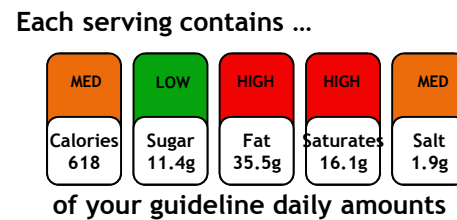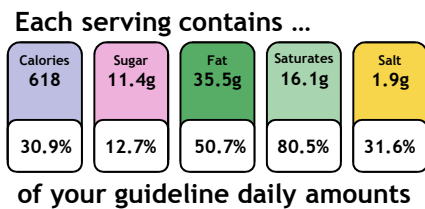back-of-pack (BOP)/front-of-pack (FOP)
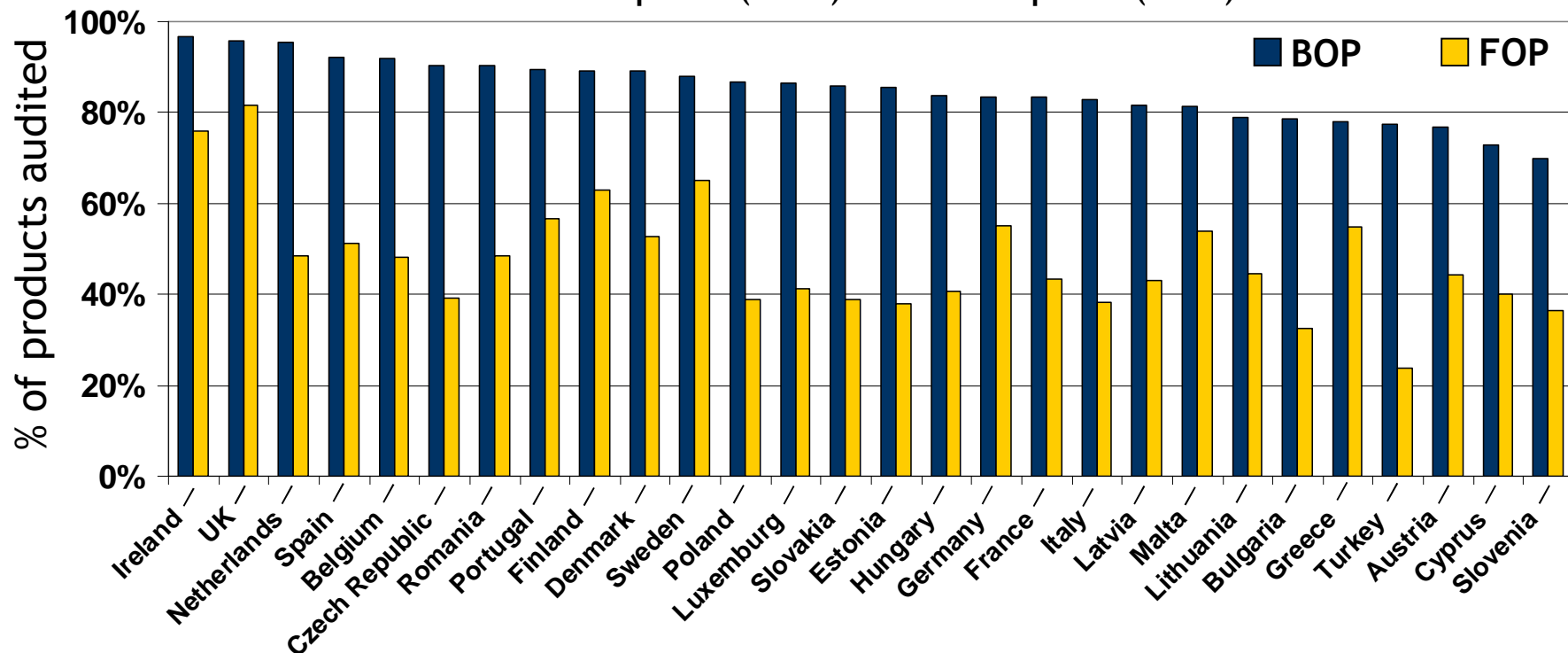
85% average penetration of **BOP** nutrition information of any kind (**70-97%**)

48% average penetration of **FOP** nutrition information of any kind (**24-82%**)
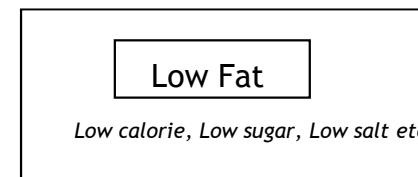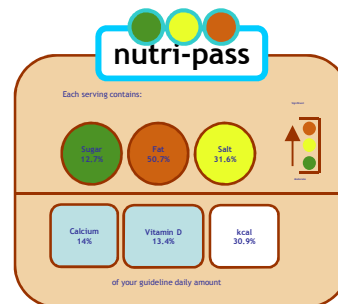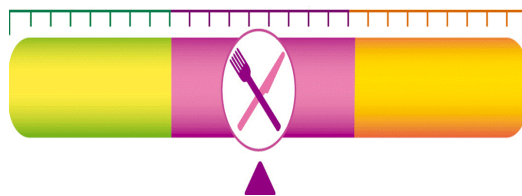
- **85%** of over **37,000** products audited displayed nutrition information (range of **70-97%**)

- Nutrition table most widespread overall, usually found back-of-pack (**84%** of products)

- Guideline Daily Amounts (GDA) and Nutrition Claims most widespread front-of-pack schemes (each **25%** of products)

Typology of nutrition labels – methodology

- UK, Poland, Turkey and France (15 participants/country – responsible for household food shopping)

- *Multiple Sort Technique* ('free' and 'structured' sorting), face-to-face interviews

- 22 different labels used as stimuli (some examples below)

Each serving contains …

Calories 618	Sugar 11.4g	Fat 35.5g	Saturates 16.1g	Salt 1.9g
30.9%	12.7%	50.7%	80.5%	31.6%

of your guideline daily amounts

Each serving contains …

MED	LOW	HIGH	HIGH	MED
Calories 618	Sugar 11.4g	Fat 35.5g	Saturates 16.1g	Salt 1.9g

of your guideline daily amounts

Per serving

Calories 618
30.9%

of an adult's GDA

EAT SMART™
BASED ON INTERNATIONAL DIETARY GUIDELINES

three
Best

Healthy   Everyday   Indulgent

nutri-pass

Each serving contains:

Sugar 12.7%   Fat 50.7%   Salt 31.6%

Calcium 14%   Vitamin D 13.4%   kcal 30.9%

of your guideline daily amount

Low Fat

Low calorie, Low sugar, Low salt etc

Typology of nutrition labels – derivation of the typology

- Inverse relationship between directiveness and information content of the labels

- Proposed typology categories:

  - **Directive** – health logos

  - **Semi-directive** - contain nutrient-based information, provide evaluation of healthiness at nutrient level, e.g., traffic light labels (TL)

  - **Non-directive** - contain nutrient-based information, leave evaluation of healthiness to the consumer, e.g., GDA labels
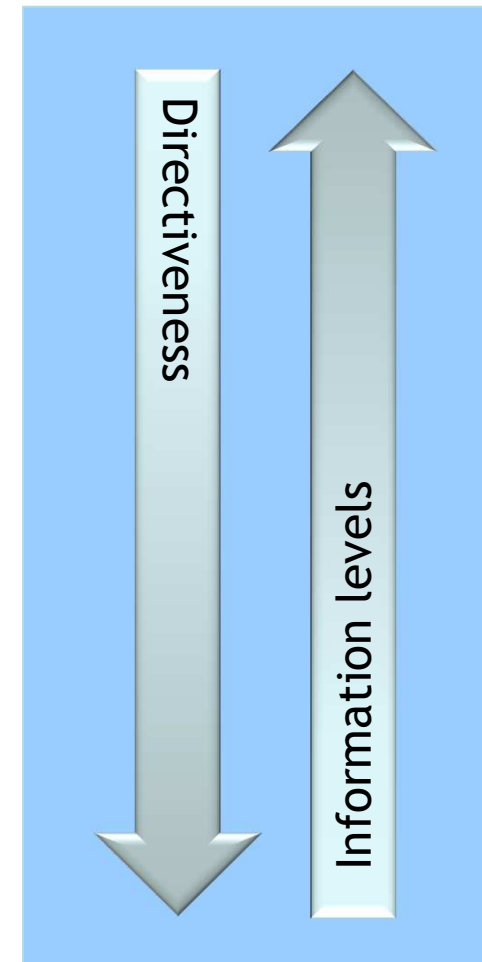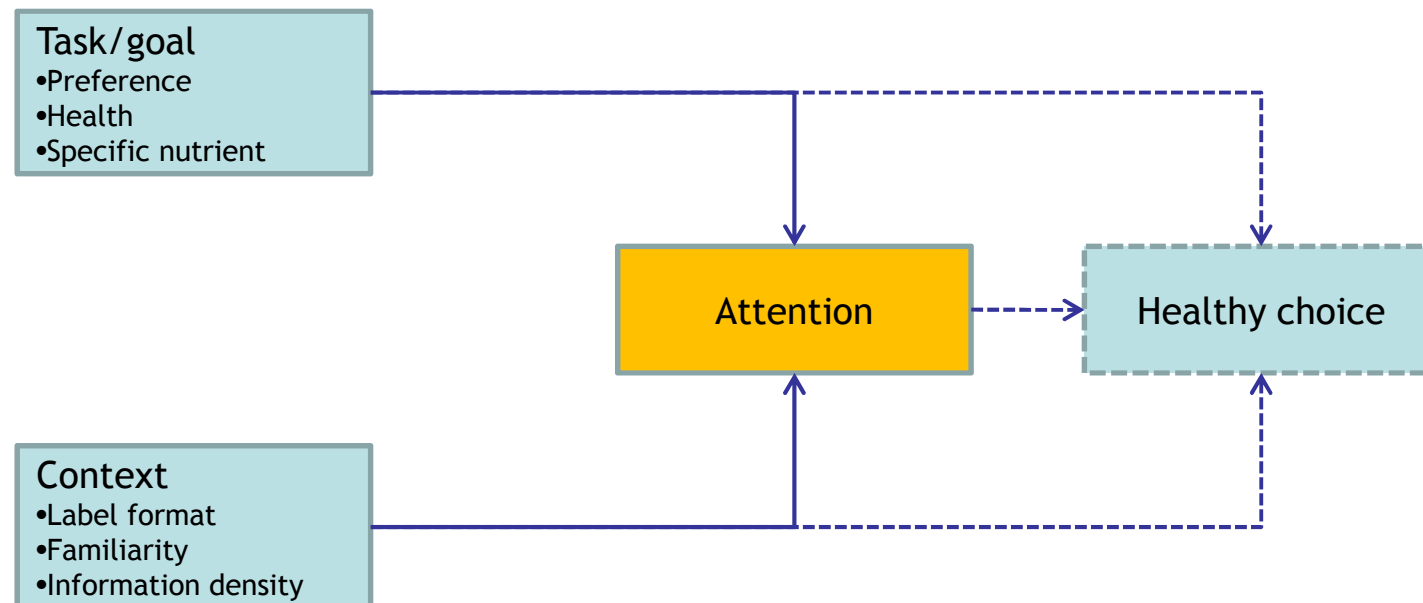
Directiveness

Information levels

Reading the label - Attention and reading

Leader: Wageningen University

- Identify and quantify key determinants of consumer attention to and reading of nutritional information on food labels in realistic situations

Task/goal
- Preference
- Health
- Specific nutrient

Attention

Healthy choice

Context
- Label format
- Familiarity
- Information density

Attention and reading- methodology

- Visual search tasks
    - Detection ("is the label there or not?"),
    - Identification ("is this particular label there or not?")

- Eye gaze measures
    - "Does the eye fixate on the label or not", if so for how long?"

- Experimental choices task
    - "Which product is being selected?"

- Self report measures
    - Spontaneous recall ("what have you paid attention to"?)
    - Aided recall ("to what extent have the following been helpful in choice"?)
    - Recognition ("have you seen a label, and if so which one?")

Attention and reading – major results

- Pure attention enhanced by
  - Health goal instead of preference goal
  - Label features (bigger size, monochrome, familiarity, consistency in location)
  - Low information density of pack on which it appears

- Effects of different formats on healthfulness of choice
  - Semi-directive (i.e. colour-coded), non-directive (i.e. monochrome GDA), and directive systems (i.e. Choices logo) all perform well
    - Directive systems perform better under time pressure
  - Label evaluation dependent on familiarity, but not product choice
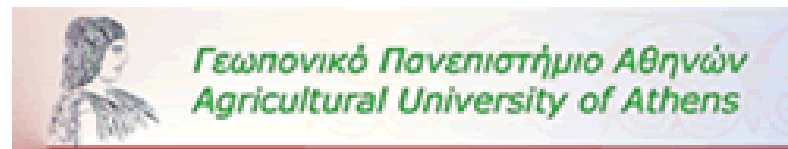
Attention and reading – conclusions

- Attention and reading is dependent on motivation
  - Specific versus general health motives
- Attention is a necessary but insufficient condition
- Attention needs to be facilitated in "smart design"
  - Label, packaging design and choice context
- Research methodology, beyond self-report
- Results differ by country
  - In evaluation (self-report) more than behaviour
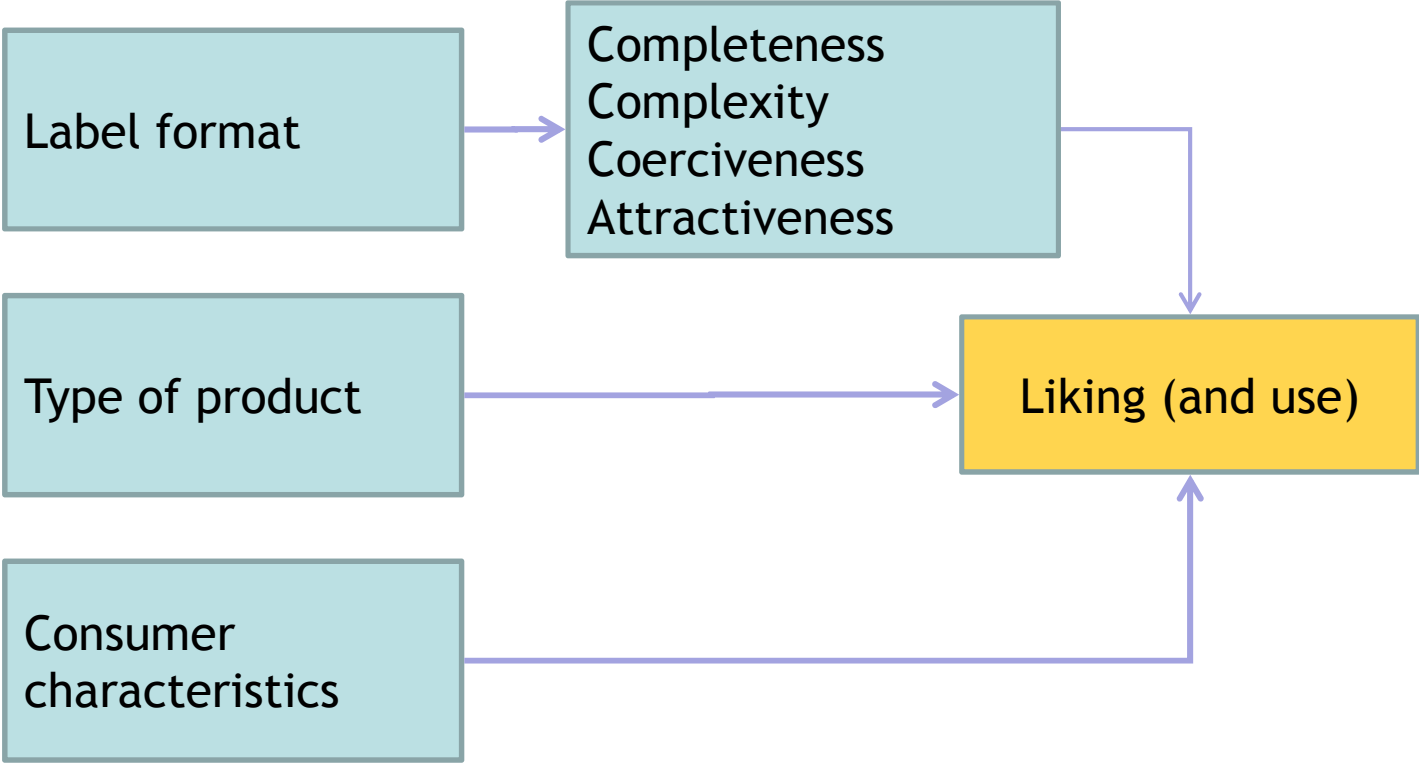
Label preferences -
Liking and attractiveness of labels

Leader: Agricultural University of Athens

Liking and attractiveness of labels

Label format → Completeness Complexity Coerciveness Attractiveness → Liking (and use)

Type of product → Liking (and use)

Consumer characteristics → Liking (and use)

Liking and attractiveness of labels – methodology

Survey

- 2000 subjects (500 per country, 60% female; 40% male) – UK, Poland, Turkey, and Germany

- Half parents of children (3-12yrs) aged between 25-55yrs; half 55+

- Participants at least partly responsible for household food shopping

- Compared 5 labelling systems, 4 food contexts (undisclosed, biscuits, pizzas, yoghurts), and 2 healthfulness levels (low and high)
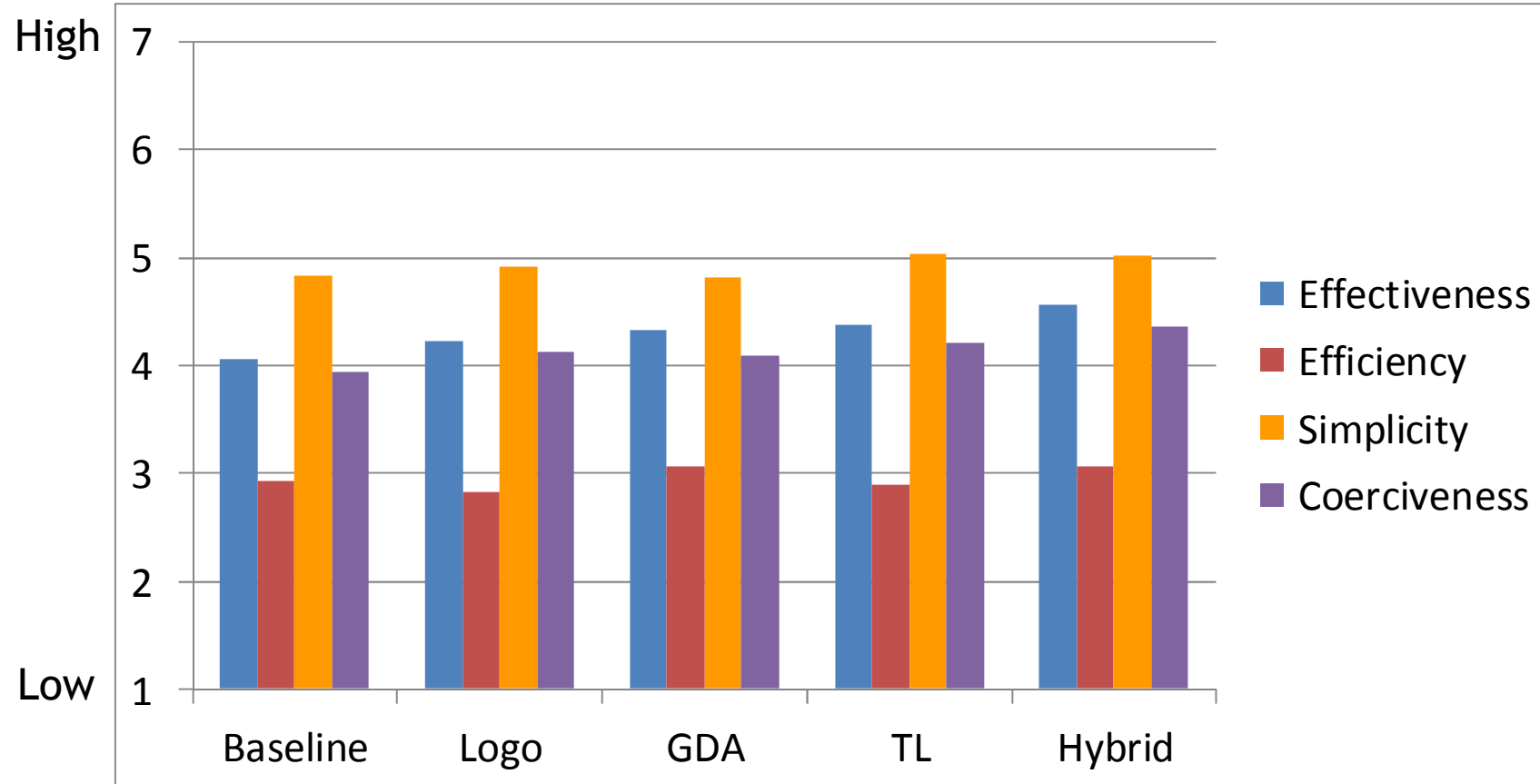
Liking and attractiveness of labels – results from choice task

Liking increases with information content and complexity: GDA/TL hybrid scored highest for both liking and intended use; some correspondence between awareness and preference
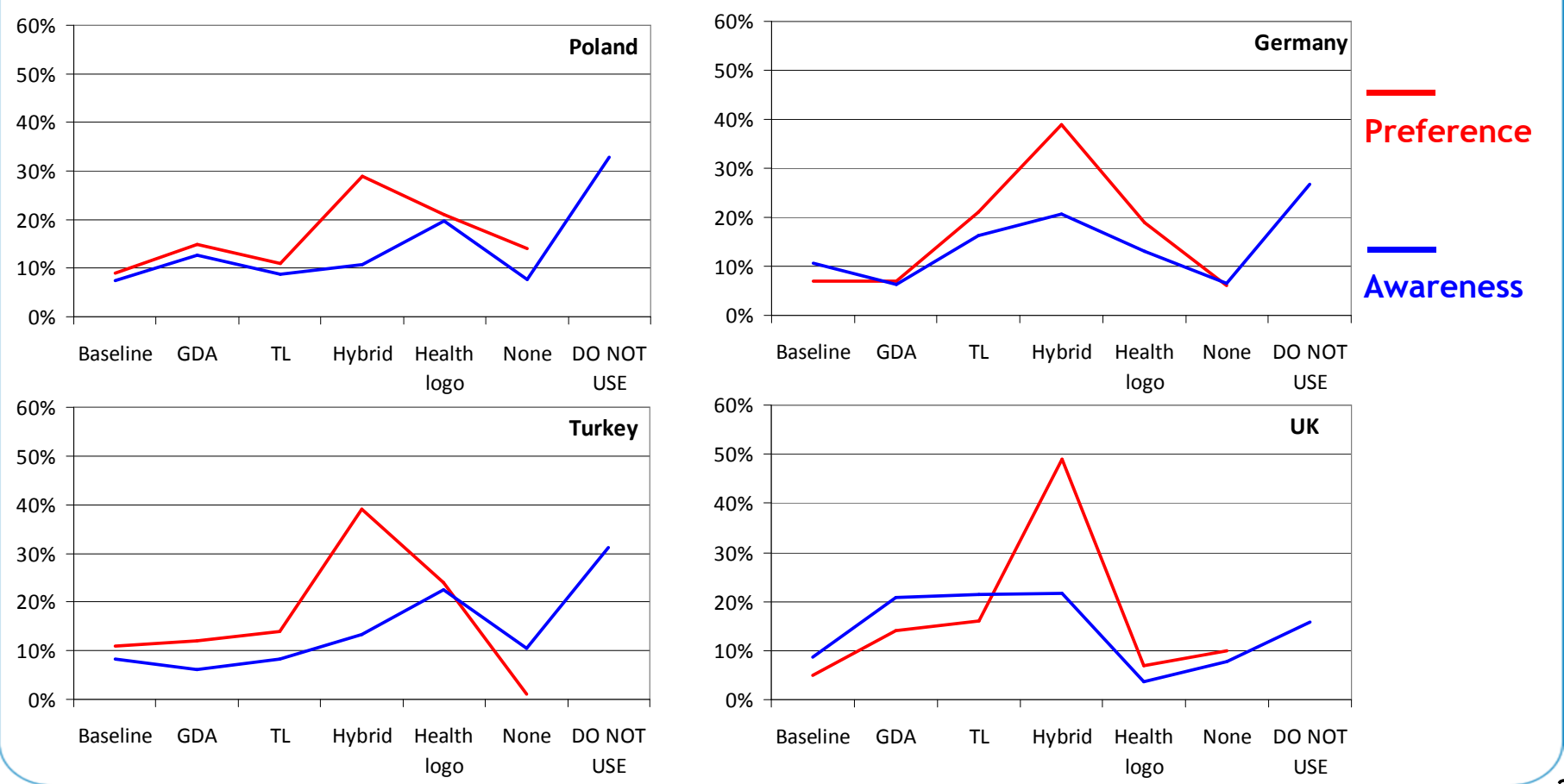
Liking and attractiveness of labels – results

Very small differences in the perceived effectiveness, efficiency, simplicity, coerciveness between the different label formats

Liking and attractiveness of labels – conclusions

- Liking increases with information content and complexity: GDA/TL hybrid system scored highest for both liking and intended use

- However, very small differences in the perceived effectiveness and efficiency between the different label formats

- Some correspondence between awareness and preference

<u>Bottom line</u>:

- Labels with highest amount of information and complexity are liked most
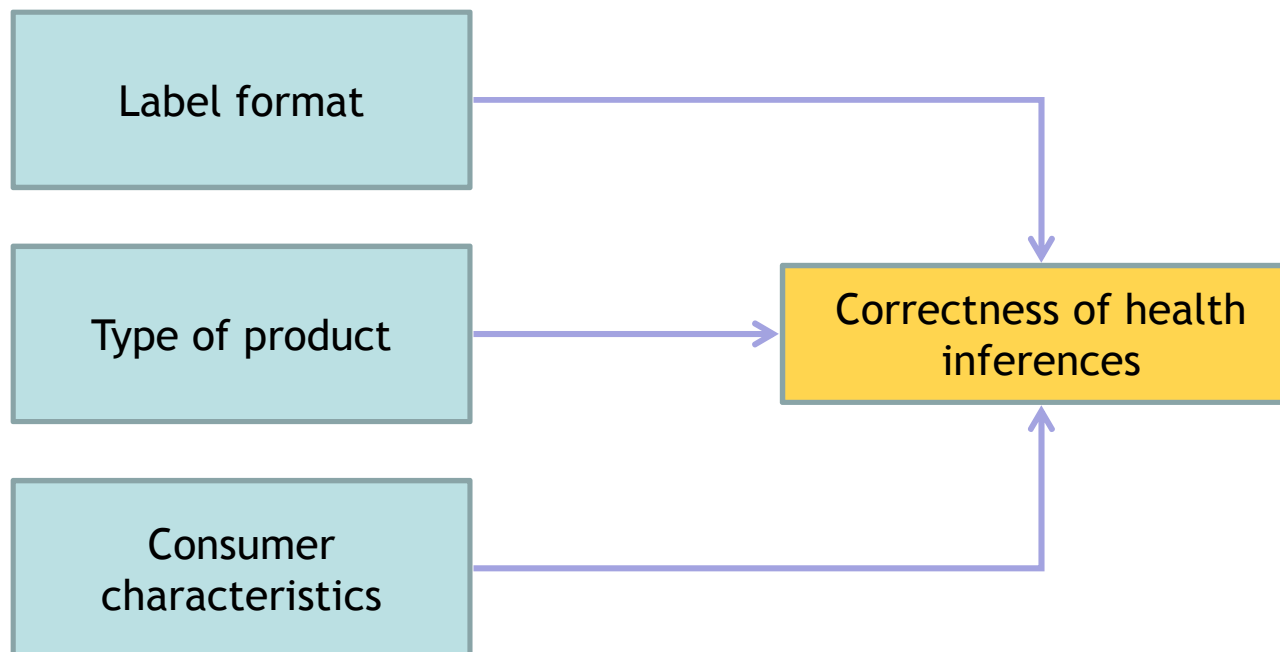
- Liking depends on previous exposure (familiarity)

Understanding and health inferences from labels

Leader: University of Surrey

Understanding and health inferences from labels

- FOP labelling systems tested across

    - 12 food products representing 3 levels of healthfulness

    - within each of 3 food categories; pizzas, yoghurts, biscuits

- Participants provide subjective healthfulness ratings for 3 product variants in a given food category with baseline labelling system prior to being exposed to same 3 foods with FOP labelling

- Comparison of subjective healthfulness ratings with SSAg/1 as a benchmark

Each 150g portion (one pot) contains

| Calories 105 | MED Sugar 11.7g | LOW Fat 2.3g | LOW Saturates 1.4g | LOW Salt 0.3g |

Each 150g portion (one pot) contains

| Calories 105 | Sugar 11.7g | Fat 2.3g | Saturates 1.4g | Salt 0.3g |

Each 150g portion (one pot) contains

| Calories 105 5% | MED Sugar 11.7g 13% | LOW Fat 2.3g 3% | LOW Sat Fat 1.4g 7% | LOW Salt 0.3g 5% |

of your guideline daily amount

Each 150g portion (one pot) contains

| Calories 105 5% | Sugar 11.7g 13% | Fat 2.3g 3% | Saturates 1.4g 7% | Salt 0.3g 5% |

of your guideline daily amount

FOP labels make overall healthfulness ratings more accurate (i.e. closer to objective health rating) (*small effect*)

LABEL - Main effect

Legend:
- Pizza
- Biscuits
- Yoghurt

Y-axis: Deviation from actual SSAg1 score (6.0, 5.0, 4.0, 3.0, 2.0, 1.0, .0, -1.0, -2.0)

X-axis: Baseline label, FOP label
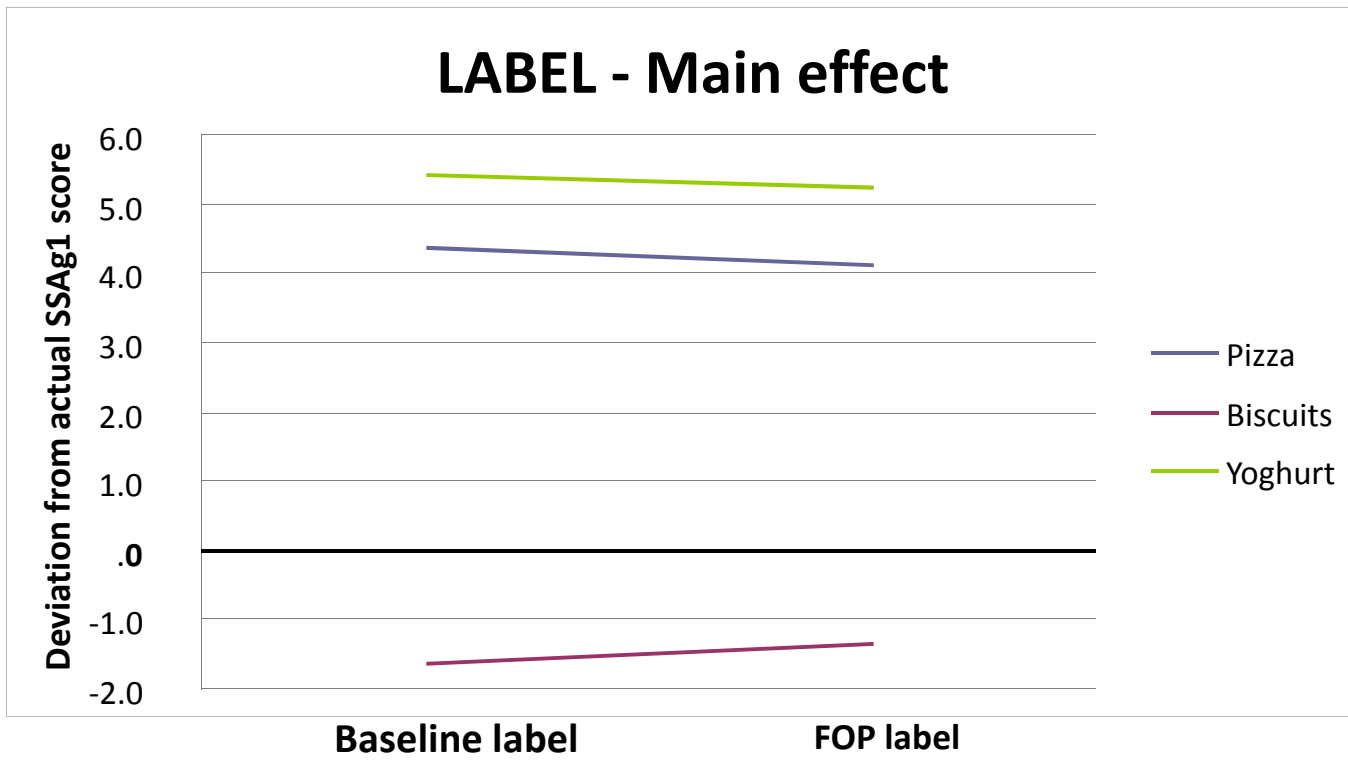
Understanding and health inferences from labels – methodology and results food sorting study

Participants ("low health interest" or type 2 diabetics) shown a range of 11 snack food products and instructed to order the foods according to healthfulness, first with no FOP label and then again with an FOP label whilst "thinking aloud"

banana chips
chocolate/sugar coated peanuts
raisins
brazil nuts
corn puffs
potato crisps
cereal bar
pistachios (salted)
fast food apple pie
apple juice
chocolate flavoured milk

■ Low health interest
■ Type 2 Diabetics

-15   -10   -5   0   5   10   15

rated more healthful than objective health score

rated less healthful than objective health score
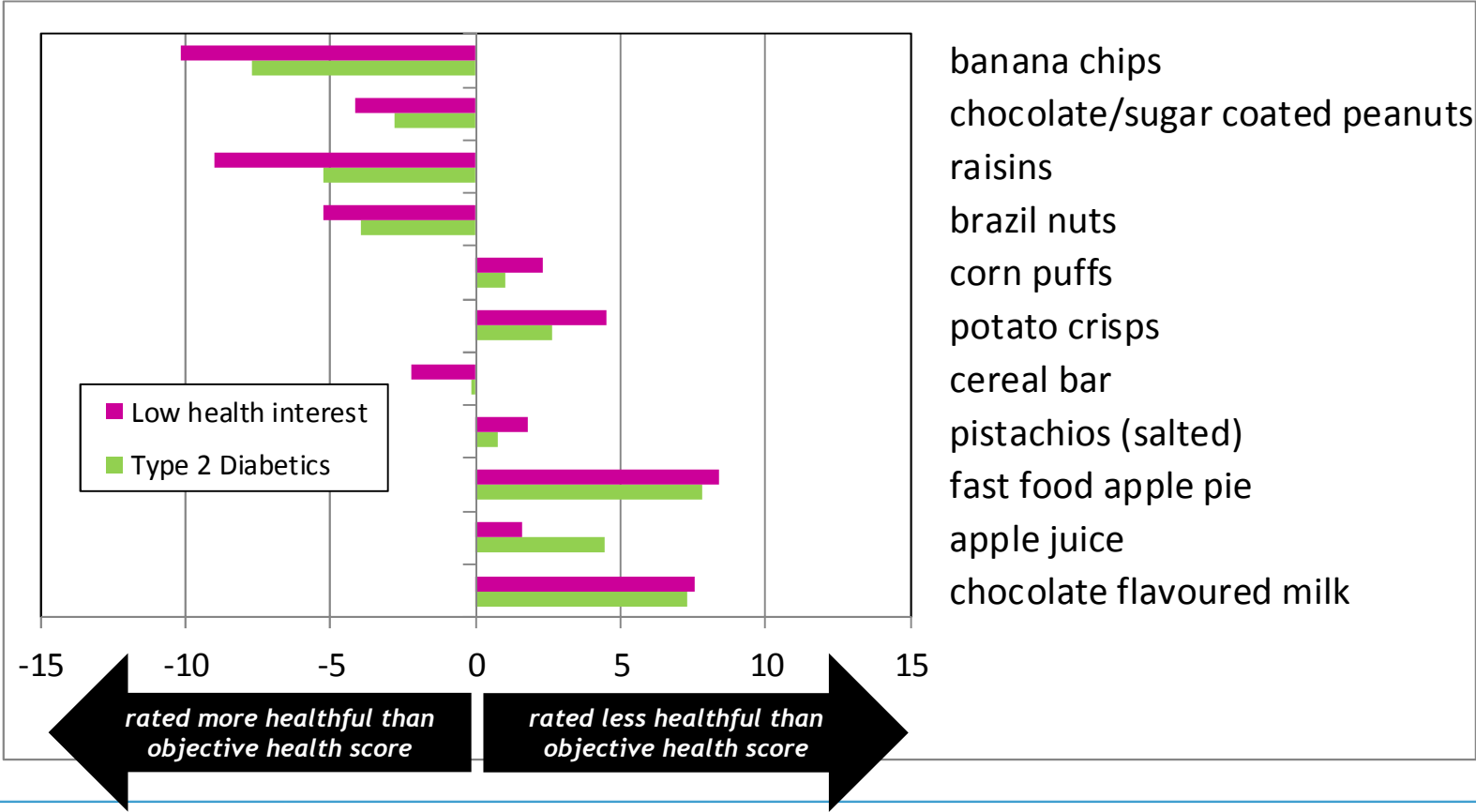
Understanding and health inferences from labels – conclusions
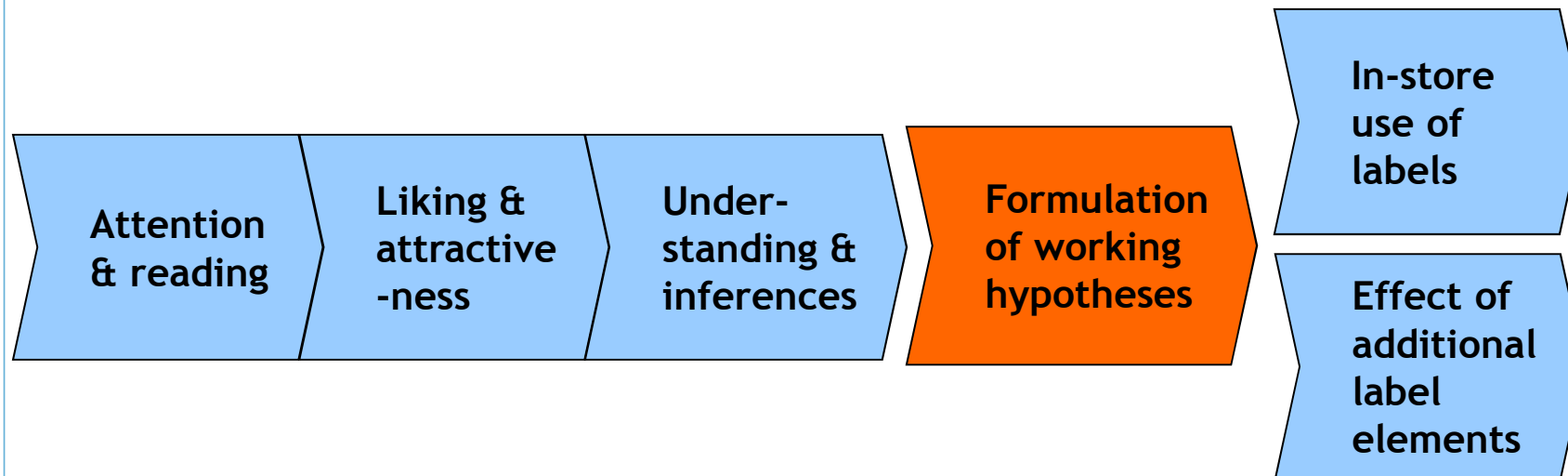
- Front-of-pack labelling systems can result in improvements to objective understanding, but effects are small

- Very little difference in improvements between various formats with differing levels of 'directiveness' beyond provision of nutrient levels only

- Nutritional information, regardless of front-of-pack format, is sufficient to enable consumers to detect more healthful alternative

Understanding and health inferences from labels – conclusions

- Absence of FOP labels leads to use of a range of other indicators of healthfulness

- Presence of FOP labels leads to more deliberative approach

- Healthfulness rating errors more likely to be reduced by inclusion of FOP label that is directive at nutrient level (colour-coding)

- FOP labels which focus on risk nutrients alone do not appear to be sufficient to identify healthfulness of certain foods

Where does this bring us?

Attention & reading → Liking & attractive-ness → Under-standing & inferences → **Formulation of working hypotheses** → In-store use of labels / Effect of additional label elements

Working hypotheses

- <u>H1</u>: Provision of information on energy and key nutrients (fat, saturated fat, sugar, salt), in calories/grams per 100g, in a way that is consistent in terms of position, font, size, colour and background, combined with a health logo ("ideal baseline label"), will improve attention and understanding, and facilitate healthy choices.

- <u>H2</u>: Additional elements (e.g. GDAs, colour coding, provision of text "low/medium/high") will not increase attention or result in major improvements in understanding, but will increase consumer liking of the label and may facilitate healthy choices.

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In-store use of labels

Leader: Saarland University

SAARLAND
UNIVERSITY

SEVENTH FRAMEWORK
PROGRAMME

In-store use of labels

Label format

Type of decision-making

Consumer characteristics

Attention
Arousal
Choices
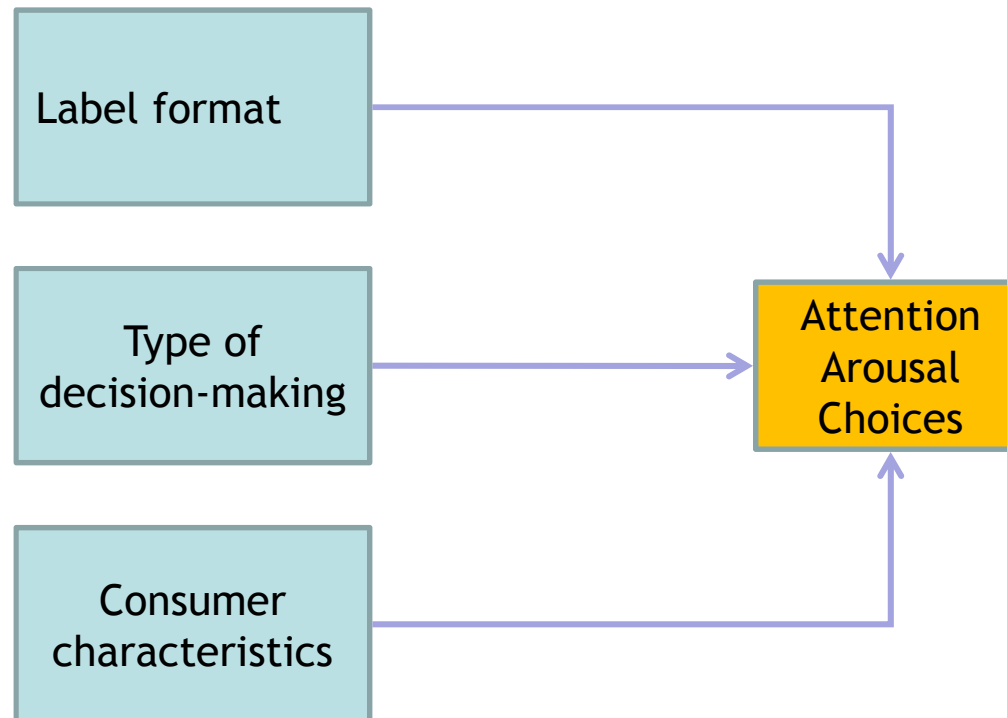
Quantified insight into the effectiveness of an "ideal baseline nutrition label" at point-of-sale for promoting healthful choices

Studies in Germany, Turkey and Poland

In-store use of labels – methodology
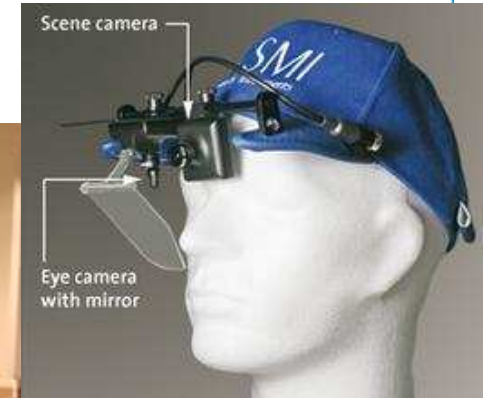
SMI
head-mounted
eye tracking
device

In-store use of labels – results (cereals)

Gaze Duration (0.922 seconds)

Legend:
- Brand name
- Product name
- Picture
- **Nutrition label**
- Claim
- Pack size
- Barcode
- Other
- Price
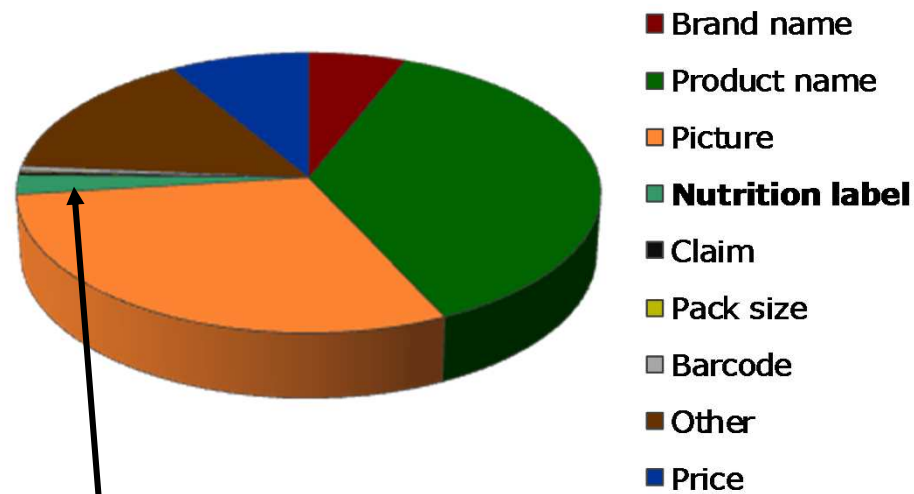
Nutrition Label
Share of attention small (0.021 seconds) against other elements of the package

Only 10% of people looked at the nutrition label

In-store use of labels – results

Products with the "ideal baseline nutrition label" get more attention compared to food items with the existing nutrition labels on FOP

Product Category		"Old" Label	"Ideal Baseline Label"	Difference significant?
Cereals	% participants looking at labels	61.1%	88.9%	NO (p=.18)
	Number of Observed Labels	1.385	3.376	YES (p<.05)
	Gaze Duration	0.290 sec	0.467 sec	NO (p=.27)
Sweets	% participants looking at labels	38.9%	94.4%	YES (p<.05)
	Number of Observed Labels	0.511	3.160	YES (p<.01)
	Gaze Duration	0.121 sec	0.626 sec	YES (p<.01)
Ready Meals	% participants looking at labels	66.7%	83.3%	NO (p=.45)
	Number of Observed Labels	1.015	5.672	YES (p<.01)
	Gaze Duration	0.148 sec	0.1033 sec	YES (p<.01)

Effects of additional label elements – methodology

What happens if the following additional elements are added to the "ideal baseline label" at 100% penetration?

- "Ideal baseline label"+ additional elements:
  1. Text (GDA or 'low/medium/high')
  2. Colour (traffic lights or shading)
  3. Combinations of these

- Field work in Germany and Poland – hall test

Effects of additional label elements – results

None of the elements improves healthfulness of choice, but expanding the product set with more healthful products can improve healthfulness of choice

Average SSAg1 scores for product set (Set) and for participant choice based on preference or healthfulness* (Choice)

Category	Country	Preference, 10 Products	Preference, 20 Products	Health, 10 Products	Health, 20 Products	
Salty	DE	10.2	5.6	9.1	2.8	Choice
Salty	DE	10.4	7.1	10.4	7.1	Set
Sweet	DE	12.0	9.3	11.3	5.3	Choice
Sweet	DE	12.1	9.2	12.1	9.2	Set
Salty	PL	9.8	5.0	9.4	2.8	Choice
Salty	PL	10.4	7.0	10.4	7.0	Set
Sweet	PL	12.3	8.6	11.7	6.8	Choice
Sweet	PL	12.4	9.4	12.4	9.4	Set

* Question: "Please have a look at the following 10/20 products and choose which of them you would most likely buy/the one that you think is the healthiest"

In-store use of labels – conclusions

- The "ideal baseline label" increases visual attention in terms of:

  - Both the number of consumers looking at labels and number of labels looked at; full penetration results in stronger effects

  - The share of attention towards the nutrition label (adjusted for label size); only significant for full penetration levels

- Gaze durations and frequencies are lower compared to laboratory situations, and too low for extensive processing of the information

- The "ideal baseline label" helps consumers with low self-control make more healthful choices

Effects of additional label elements – conclusions

- Adding GDA or traffic light information to the labels neither increases visual attention nor promotes more healthful choices
    - Respondents <u>not</u> more motivated to choose according to health
    - However, in a take-home choice task, there was an interaction of health logo and traffic light coding in affecting healthfulness of choice
    - Respondents <u>do</u> perceive themselves to be more capable of choosing the healthful product
- Expanding the product set with more healthful products can improve healthfulness of product choice considerably
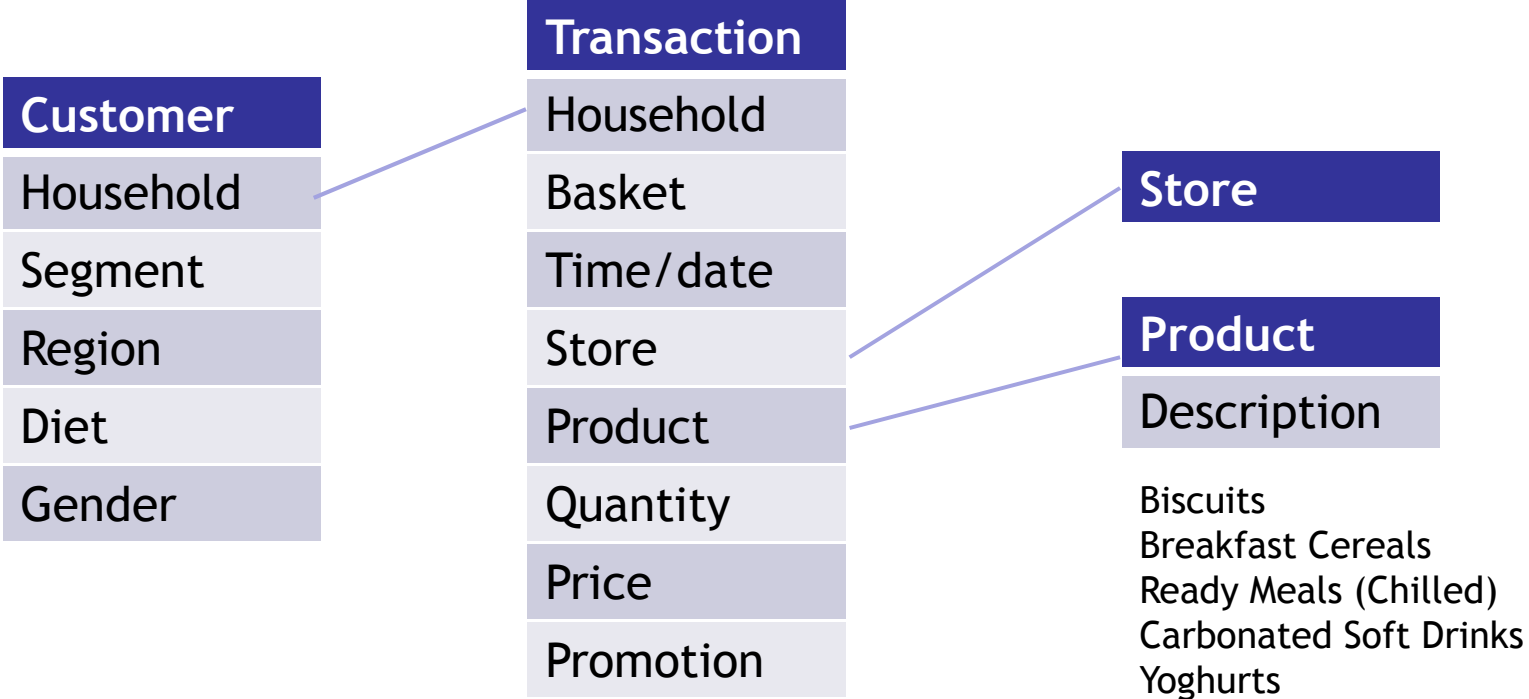
Effects of labels on dietary intake

Leader:
Georg-August Universität Göttingen

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- Research protocol developed to merge scanner data, product data, and personal data

Customer

| Household |
| Segment |
| Region |
| Diet |
| Gender |

Transaction

| Household |
| Basket |
| Time/date |
| Store |
| Product |
| Quantity |
| Price |
| Promotion |

Store

Product

| Description |

Biscuits
Breakfast Cereals
Ready Meals (Chilled)
Carbonated Soft Drinks
Yoghurts
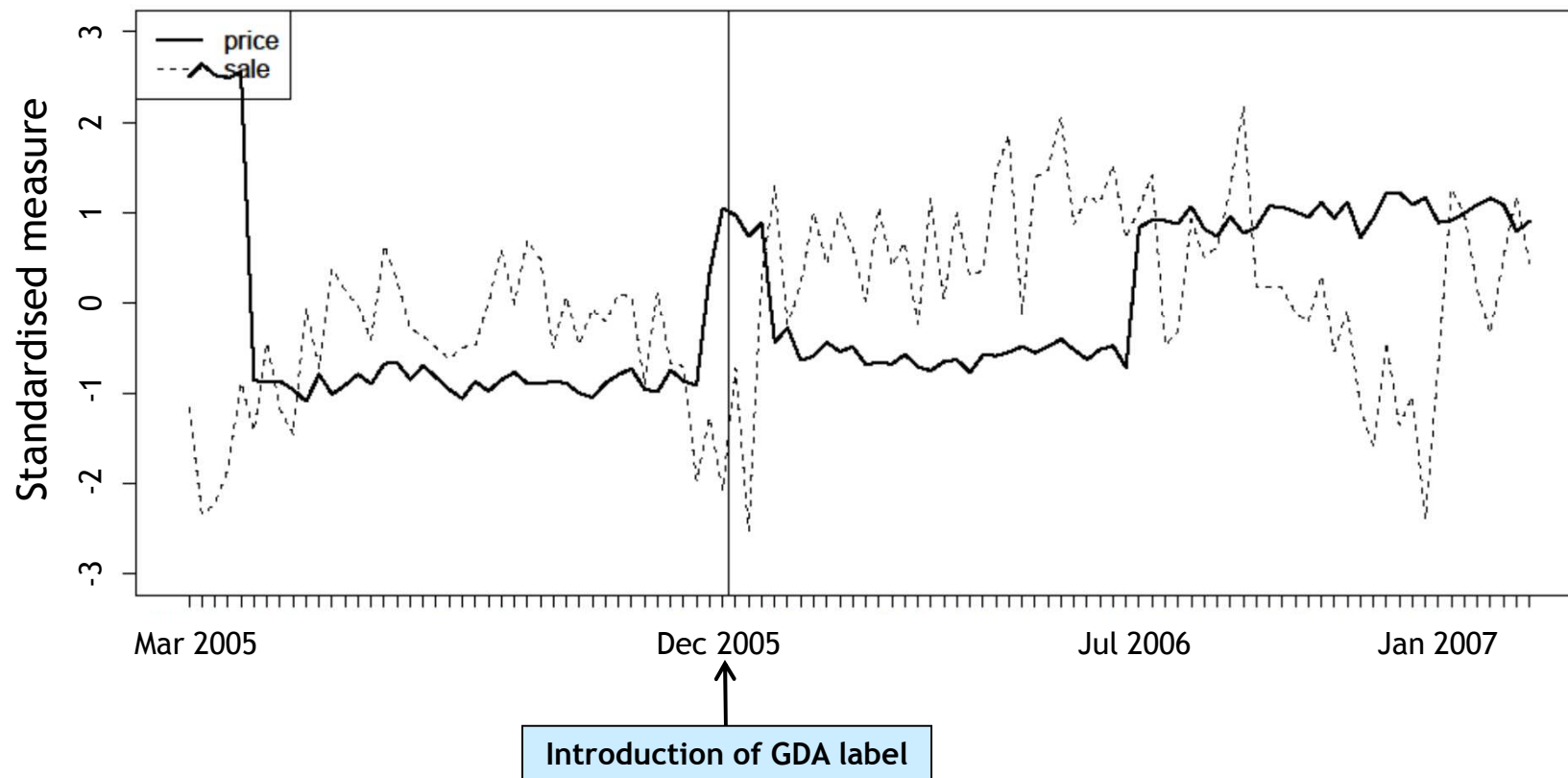
5-year period 2004-2009

Effects of labels on dietary intake – example of results

Time series analysis

Natural Yoghurts

Introduction of GDA label

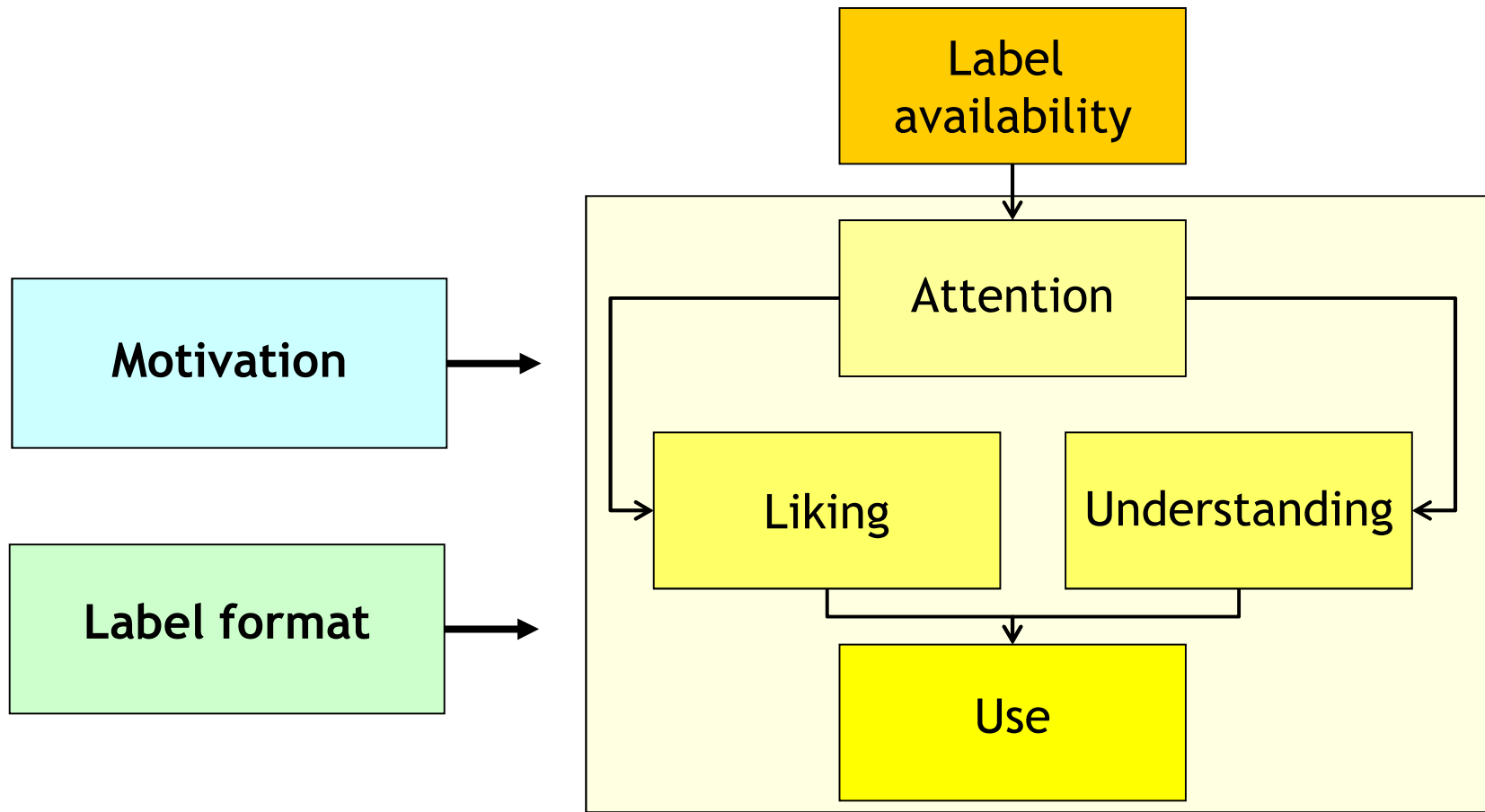# Effects of labels on dietary intake – conclusions

- Time series analyses fail to reveal an apparent short-term effect of GDA labelling on sales

- Price increases by the retailer before GDA label introduction mask potential short-term effects of labelling on sales

- Products without price changes before GDA label introduction show no clear relationship between changes in sales and GDA label introduction

- Results confirm previous research

Overall conclusions

A simplified framework

Potential bottlenecks

No label availability

Lack of attention

Lack of motivation

No liking

Lack of understanding

Wrong label format

No use
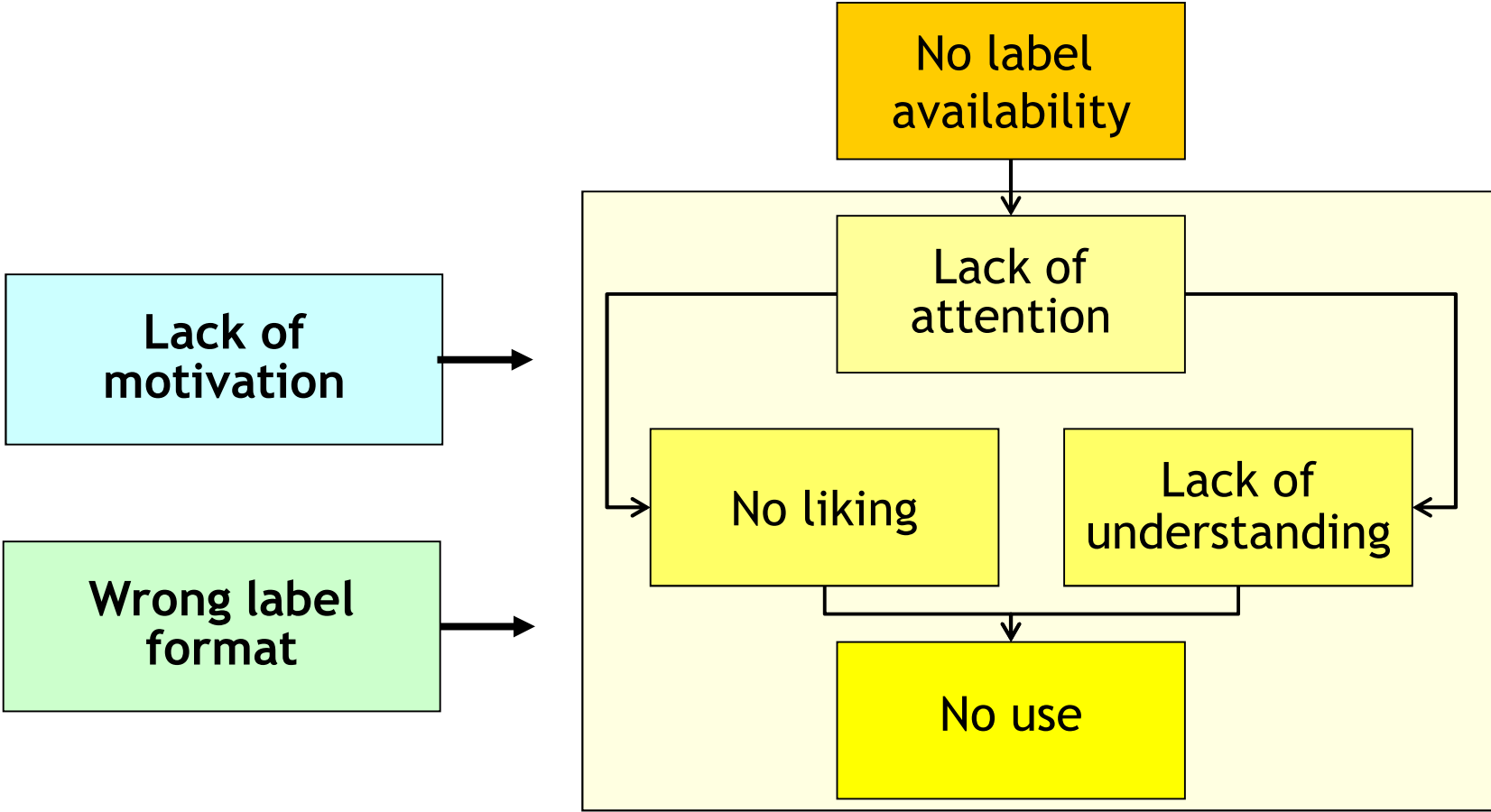
Is lack of availability a bottleneck?

YES AND NO

- Across Europe, most products do carry nutrition information. FLABEL research shows that 85% had nutrition information on the back of the pack, and 48% on the front of the pack.

  (Penetration data)

- However, consistent front of pack information with 100% penetration would help.

  (Attention & reading, In-store studies)

Is lack of attention a bottleneck?

YES

- Attention is a major bottleneck with regard to effects of nutrition labels on choice behaviour. Average attention to nutrition labels is very short, between 25 and 100 milliseconds.

- Attention is related to motivation (more so than to label format).

(Attention & reading, In-store studies)

Is lack of liking a bottleneck?

NO

- Consumers like the idea of front-of-pack nutrition labelling.

- Consumers like complex labels most (such as colour-coded GDA) and think they are most likely to use them. However, liking and imagined use are not correlated with actual impact on choices.

(Previous research, Attention & reading, Liking & attractiveness, Understanding & health inferences)

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Is lack of understanding a bottleneck?

NO

- Consumers have no problems ordering products according to healthfulness when they are given basic nutrition information.

- Variations in label format have only small or no effects.

(Previous research, Understanding & health inferences)

Is lack of motivation a bottleneck?

YES

- There are many other considerations apart from health when making food choices (e.g. habitual buying, time constraints).

- Selecting according to preference is only partly determined by health considerations.
   - Labels more helpful for people with low self-control.

(Previous research, Attention & reading, In-store studies)

YES AND NO

- Providing consistent information that combines food/nutrient level information, directive/non-directive, can improve attention.

  (Attention & reading, In-store studies)

- A health logo can help especially in situations of time pressure.

  (Attention & reading)

- Adding GDAs, additional text, traffic light colours has little or no effect.

  - Colour coding has small effects in certain situations: discrepancies overall health image/single nutrients, evaluation of less healthy alternatives/categories.

  (Attention & reading, Understanding & health inferences, In-store studies)
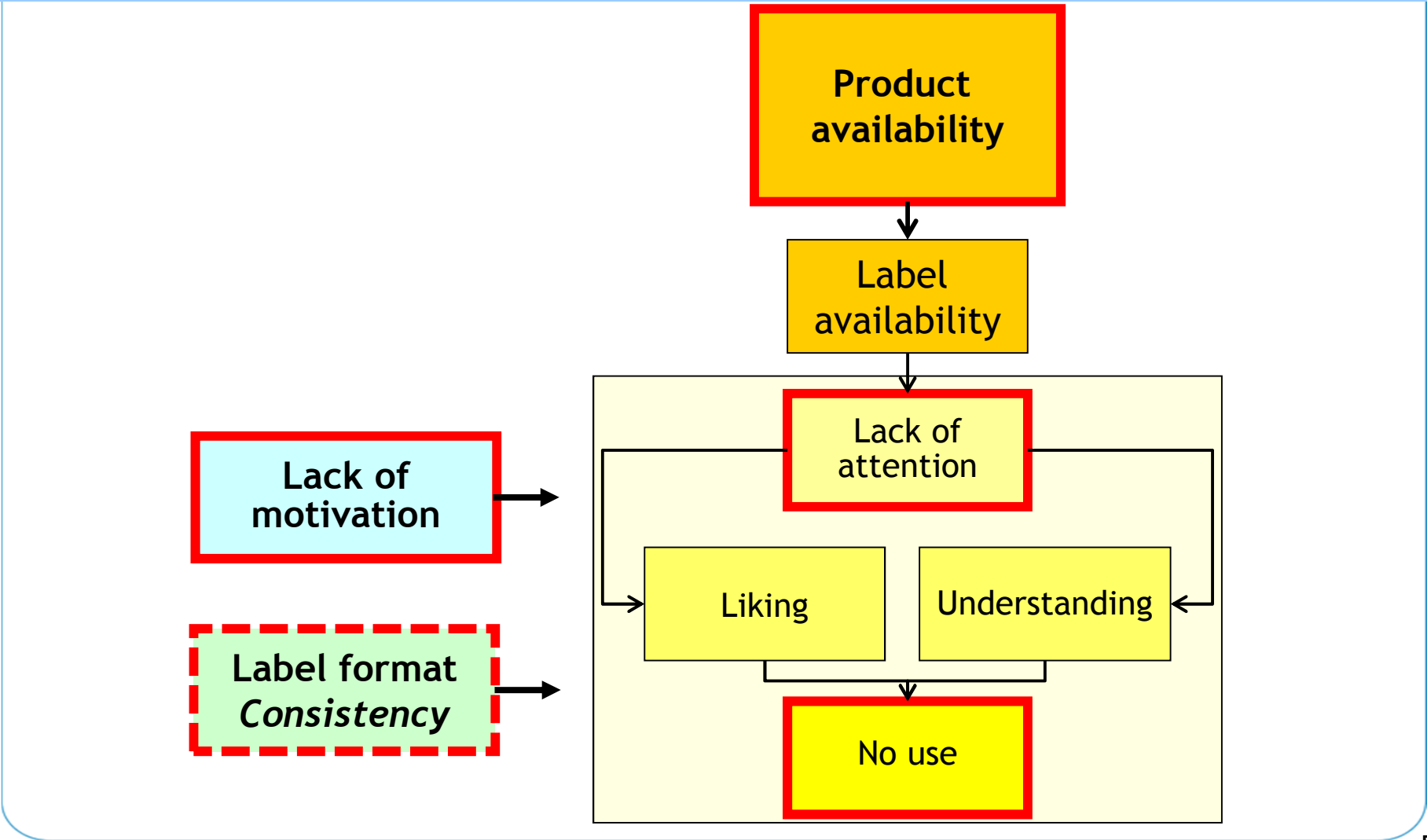
Policy implications

- Discussed with stakeholders at consensus workshop in November 2011

- Tentative conclusions
  - Need to see nutrition labelling in a broader context
  - Broad penetration of FOP nutrition information desirable
    - Nutrient-based
    - Can be supplemented by health logo
  - Consistency and familiarity more important than adoption of any particular format
  - Nutrition labelling also has important function as incentive for product reformulation and product innovation

Acknowledgements

- DG Research FP7- FLABEL (Contract n°211905)
- FLABEL Consortium

- Stakeholders Advisory Board
- Check www.flabel.org for updates on publications

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Thank you!

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