

The European Commission's science and knowledge service

Joint Research Centre



**- Update on ongoing JRC study -
Overview of existing and proposed FOP schemes,
including literature review of research regarding
the development of the schemes,
their impact on consumers and other effects**

Joint meeting on front-of-pack nutrition labelling between Working Group of the Standing Committee on Plants, Animals, Food and Feed - Regulation (EU) No 1169/2011 on the provision of food information to consumers (FIC) & Advisory Group on the Food chain, Animal and Plant Health

Brussels, 22 October 2018

Content – part I

- **FOP labelling effects on diet & health**
 - Associations of diet quality with health outcomes
 - Effect of FOP labels on food perception
 - Effect of FOP labels on food selection in online choice tasks
 - Effect of FOP labels on food selection in offline choice tasks
 - Meal selection/preparation studies
 - Modelling studies estimating FOP labelling impact on nutrient intakes
 - Modelling studies estimating FOP labelling impact on health
- **FOP labelling effects on reformulation**

FOP labelling effects on diet & health

- **Associations of diet quality with health outcomes**

FSA-NPS DI^a score positively associated with

- **CVD risk** in NutriNet¹ and SU.VI.MAX² cohorts; Hazard Ratio (HR) of **1.4-1.61** in poorest compared to best diet quality quartile
- **Cancer risk** in SU.VI.MAX³ and EPIC⁴ cohorts; HR of **1.07-1.34** in poorest compared to best diet quality quintile
- **Higher BMI** in men in SU.VI.MAX cohorts 1 and 2⁵; Odds Ratio of **1.12** for overweight, **1.16** for obesity per 1-point increase in the FSA-NPS DI score

NB: Study cohorts tended to be healthier than average population.

^aFood Standards Agency Nutrient Profile System Diet Index

¹Adriouch et al. 2016; ²Adriouch et al 2017; ³Donnenfeld et al. 2015;

⁴Deschasaux et al. 2018; ⁵Julia et al. 2015

FOP labelling effects on diet & health

• Effect of FOP labels on food perception



- NL: Highlighting reduced salt content on chicken soup either explicitly or through "healthy choice" logo – without actually changing it – reduced expected liking; no impact of label on actual liking¹



- AUS: Testing regular, -15% salt, and -30% salt variants of chicken noodle soup, a "Pick the Tick" logo did not compromise expected and actual liking relative to no label control²

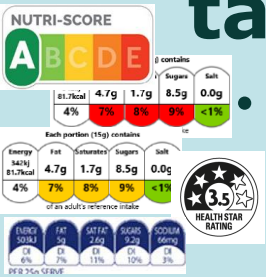
NB: Attention should be paid to label features and socio-cultural context in order to achieve desired impact.

¹Liem et al. 2012a

²Liem et al. 2012b

FOP labelling effects on diet & health

• Effect of FOP labels on food selection in online choice tasks – experimental data



- FR/AUS: Nutritionally favourable effects of Nutri-Score, HSR, and UK MTL on portion size selection; neutral to slightly negative impact for Daily Intake Guide (DIG) and ENL, respectively^{1,2}



- UY: Warning labels discouraged biscuit choice in both hedonic- and health-minded consumers³



- NZ: TL better than DIG in helping normo- and hypertensive people identify healthier food choice; DIG rendered high-sodium option more attractive⁴



- US: "Smart Choices"-type logo tripled healthfulness of breakfast cereal choice⁵

¹Egnell et al. 2018; ²Talati et al. 2018;

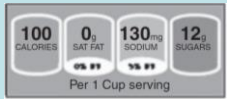
³Tortora & Ares 2018; ⁴McLean et al. 2012

⁵Bui et al. 2013

FOP labelling effects on diet & health

• Effect of FOP labels on food selection in offline choice tasks – experimental data

- US: In fake supermarket, marginally beneficial effects of TL-coded Facts-Up-Front label, but only when combined with in-aisle explanation; no effect of Facts-Up-Front alone¹
- UK: Consumers willing to pay more for shopping baskets that have no red TL for any nutrient; substantially less concern for switching from amber to green²



CHOICE CARD 1

Food Basket	Option 1	Option 2	Option 3	
Salt	Amber	Red	Amber	Don't Know
Sugar	Amber	Amber	Amber	
Fat	Red	Amber	Red	
Saturates	Amber	Amber	Red	
Price of basket	£20	£25	£30	
Tick ONE and only one box				

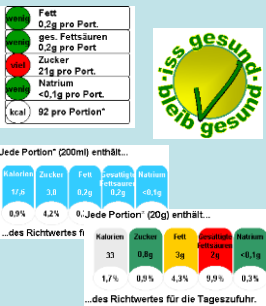
NB: Importance of accompanying education measures.

¹Graham et al. 2017

²Balcombe et al. 2010

FOP labelling effects on diet & health

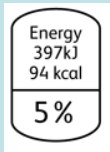
• Meal selection/preparation studies (examples) – experimental data



DE: In subjects asked to compose a day's food basket, **no overall difference of FOP labels** (MTL, healthy choice tick, GDA, TL-coded GDA) on energy and nutrient content; by product category, TL best on dairy products and Tick logo on breakfast cereals¹



• AUS: In subjects asked to serve themselves adequate portions of breakfast cereal, fruit salad, and chocolate, and a three-component meal from a fake food buffet, **no impact of calorie or HSR labelling**²



• NL: **No impact of GDA labelling** on soft drink portion choice in cinemas³

¹Borgmeier & Westenhofer 2009

²Brown et al. 2017

³Vermeer et al. 2011

FOP labelling effects on diet & health

- **Modelling studies - FOP labelling impact on nutrient intakes**

- CA: Replacing any products with one or more red lights by similar foods not bearing any red lights where available, or otherwise by the healthiest option: Lower intake in **energy** (-5%), **total fat** (-13%), **saturated fat** intake (-14%), and **sodium** (-6%). No effect on sugar intake¹
- MX: Using MCNE nutrient profile criteria, intake reductions in **energy** (-5.4%), **saturated fatty acids** (-18.9%), **trans fat** (-20%), **total sugar** (-36.8%), and **sodium** (-10.7%), plus increase in **fibre** intake (+15.5%). With COFEPRIS criteria (similar to EU Pledge), changes for **trans fat** (-20%) and **sodium** (-9.7%)²

¹Emrich et al. 2017

²Mendoza et al. 2018

FOP labelling effects on diet & health

• Modelling studies - FOP labelling impact on nutrient intakes



- FR: Shifting diets towards products with **better Nutri-Score** resulted in **more people achieving dietary recommendations**; substitution scenarios resulted in lower intakes in fat, sugars, and added sugars, and increased fibre intake; effects more pronounced in people with Western or Traditional compared to healthy diet¹



- NL: Shifting towards Choices-labelled products, **lower** intake in **energy** (-15%), **sodium** (-23%), and **trans fats** (-63%), with other nutrients to limit (total fat, total sugar, saturated fat) falling between sodium and trans fat reduction levels. **Positive nutrients increased** between 5% (folic acid) and 28% (fibre)²

¹Julia et al. 2016

²Roodenburg et al. 2009

FOP labelling effects on diet & health

• Modelling studies - FOP labelling impact on nutrient intakes



- NZ: Pick the Tick programme compared to counterfactual of no programme **reduced** daily intakes in **saturated fat** (-1 g; -3.2%), **sodium** (-38 mg; -1.1%), and **energy** (-72 kJ; -0.8%)¹



- FI: Replacing foods from four food groups majorly contributing to intakes of hard fat, sodium, and fibre with products complying with Heart Symbol criteria **reduced** intake of **hard fat** by 34.6% (14.3 -> 9.9E%), **salt** by 11% (7.6 -> 6.8 g/day)²

¹Wilson et al. 2014

²Raulio et al. 2017

FOP labelling effects on diet & health

• Modelling studies - FOP labelling impact on nutrient intakes



Consistently switching to Keyhole products would improve daily intakes as follows:

- SE: total calories (-11%), fat (-29%), saturated fat (-40%), and added sugar (-9%); dietary fibre intake (+30%), wholegrain (+754%)¹
- DK: energy (-1000 kJ), saturated fat (-27%), salt (-1 g), wholegrain (+76%), dietary fibre (+18%)²
- NO: total fat (-11.4 g, -13%), saturated fat (-8.9 g, -26.5%), and energy (-403 kJ, -4.3%); dietary fibre intake increased (4.7 g, 19.3%)³

¹Amcoff et al. 2015

²Biltoft-Jensen et al. 2015

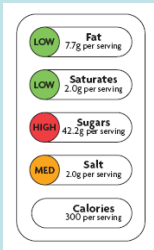
³Astrup et al. 2015

FOP labelling effects on diet & health

• Modelling studies - FOP labelling impact on health



- AUS: HSR-motivated product reformulation with subsequent reductions in energy intakes could lead to **body weight reductions** and **gain in healthy life years**¹



- AUS: **10% shift** towards healthier options with mandatory TL labelling on selected food products would change energy intake (-154 kJ/day in men, -88 kJ/d in women), with subsequent reductions in weight (-1.6 kg for men, 0.9 kg for women); if **10%** of population responded, **45,000 DALYs**^a could be averted²



- NL: If whole population switched to Choices-labelled products where possible, improved blood lipids would yield **1.59% reduced risk** of myocardial infarction³

NB: Scenarios usually rely on very optimistic assumptions.

¹Mantilla Herrera et al. 2018

^aDisability-Adjusted Life Years

²Sacks et al. 2011

³Vyth et al. 2012

FOP labelling effects on reformulation

• Self-report data suggest... (examples)



- NL: Choices logo led to reformulation of 168 out of 821 products (20%) assessed¹
 - Soups category most frequently affected
 - Largest changes seen for sodium and fibre in sandwich category



- NZ: HSR products (n=807; 5.3% of all products) higher in energy and protein but lower in saturated fat, total sugars, and sodium compared to non-HSR products²
 - significant changes observed for overall mean energy (-29 KJ/100 g), sodium (-49 mg/100 g), and fibre (+0.5 g/100 g)



- CL: 18% of 5,343 products evaluated in 2016 had been reformulated³

¹Vyth et al. 2010

²Ni Mhurchu et al. 2017

³Chilean Ministry of Health 2017

Reminder

- **Methodological issues**

- **Study design**

- Experimental vs. empirical

- **Within-label variation**

- e.g. 5-CNL vs. Nutri-Score; variants of Multiple Traffic Lights

- **Research question**

- FOP labels differ in their ability to answer different research questions

Content – part II

Evidence on consumer purchasing behaviour

1. Empirical versus experimental data
2. Empirical studies on consumers (retailers data)
3. Empirical studies on consumers (other facilities data)
4. Remarks/ideas for future research on consumers behaviour

1st part

Evidence on impact on supply side (reformulation)

5. FoP: empirical studies on suppliers and reformulation
6. What happened in the US, on calorie posting
7. Concrete idea(s) for future research

2nd part

Impact on Purchasing Decisions

Main Results:

- ❖ **Significant effect in presence of a dietary goal** (Machin et al. 2018; Van Herpen & Van Trijp 2011)
- ❖ **Non-existent or marginal effect** due to:
 - More salient factors: prices and discounts (Waterlander et al. 2013); time constraint (Cohen & Babey 2012); taste (Koenigstorfer et al. 2014); habit (Boztug et al. 2015); cognitive load and fatigue (Cohen & Babey 2012)
- ❖ **No clear evidence on the best label:** Evaluative and reductive systems are related to **opposite cognitive processes** (Sanjari et al. 2017)

Empirical data on Purchasing Decisions

ACTUAL PURCHASING BEHAVIOUR

(empirical data or large scale trials)

PROS:

- More realistic environment (external validity)
- Choice bears consequences

CONS:

- It is difficult to control for confounding factors

Impact on Purchasing Decisions

- ❖ Empirical data from retailers to evaluate the impact of FOP labels on consumers' behaviour in real shopping situations
- ❖ Study on TLs in the UK (Sacks et al. 2009)
 - sales data indicated that TL-labelling had practically no effect on food purchases.
 - short period (1 month) and small number of products (18).
 - Loyalty cards.
- ❖ Boztuğ et al. (2015) analysis of scanner data provided by a large UK retailer.
 - Focus on two food categories, using store-brand products with monochrome GDA
 - GDA does not affect product choice behaviour.
 - Instead, price and habit exhibit a greater impact on purchase behaviour and product choice than the GDA label introduction.

Impact on Purchasing Decisions

- ❖ Empirical data from facilities to evaluate the impact of FOP labels on consumer behaviour in real shopping situations
- ❖ TL in sport facility (Olstad et al. 2015).
 - Positive impact of labels
 - One week before vs. one week after
 - No negative effect on revenues
- ❖ Hospital cafeteria (Sonnenberg et al. 2013; Thorndike et al. 2014)
 - Large hospital cafeteria with a mean of 6511 transactions daily.
 - After a 3-month baseline period, cafeteria items were labelled green; yellow; or red *and rearranged to make healthy items more accessible.*
 - Respondents who noticed labels (33%) were more likely to purchase healthier items.
 - A traffic-light and choice architecture cafeteria intervention resulted in sustained healthier choices over 2 years.

Impact on Purchasing Decisions

- ❖ Empirical data mixed with survey data to evaluate the impact of FOP labels on consumers' behaviour in real shopping situations
- ❖ Vyth et al. (2010) on Choices logo
 - validated questionnaire about motivation for food choice
 - Nine supermarkets in The Netherlands (404 respondents)
 - 62% reported familiarity with the logo
 - Food choice motive 'hedonism' was negatively associated with purchasing products with the logo

Remarks/ideas for future research on consumers behaviour

IDEAS for future research on consumer behaviour

1. More studies in a more realistic environment with incentives (lab experiments, field interventions, real sales data)
2. More cross-country comparisons.
- 3. More research with the support and data by the industry (retailers, producers)**

Caveat:

- Poorly done empirical analysis may be misleading
- Causality is extremely hard to identify

Impact on the supply side

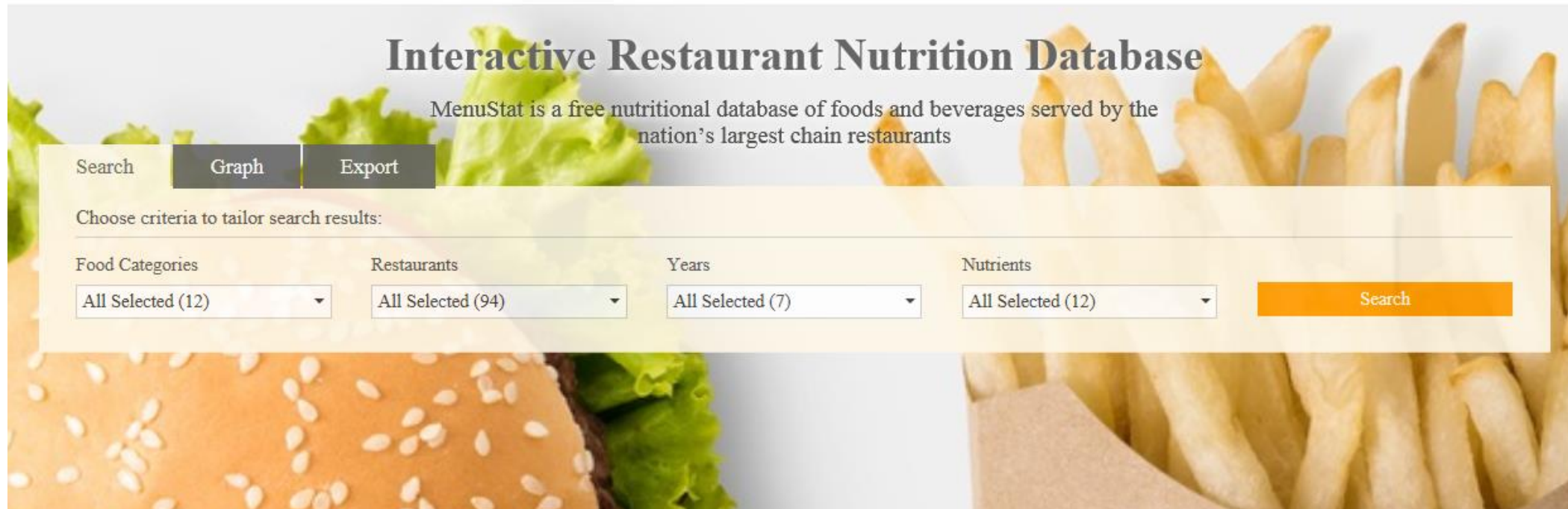
Studies on food manufacturers' responses to FOP labels are rather **scant**. There is still no systematic and comprehensive assessment of the effects of FOP labels on food reformulation and supply strategic behaviour.

- ❖ There is some evidence that FOP labels influence food composition (Netherlands, Canada, Australia, New Zealand), though based on self-reported data
- ❖ However, better nutrition composition not always correlated with FOP label frequency (Van Camp et al. 2012)

- ❖ Potential reasons:
 - Reformulation occurs only for nutrients highlighted by FOP labels (Carter et al. 2013)
 - Low incentives within same labelling grade (Van Camp et al. 2010)
 - FoP labelling as marketing strategy for producers and retailers (Newman et al. 2014)
 - More likely to be present on private label products (Van Camp et al. 2012)

Product reformulation, how to measure it

MenuStat



Interactive Restaurant Nutrition Database

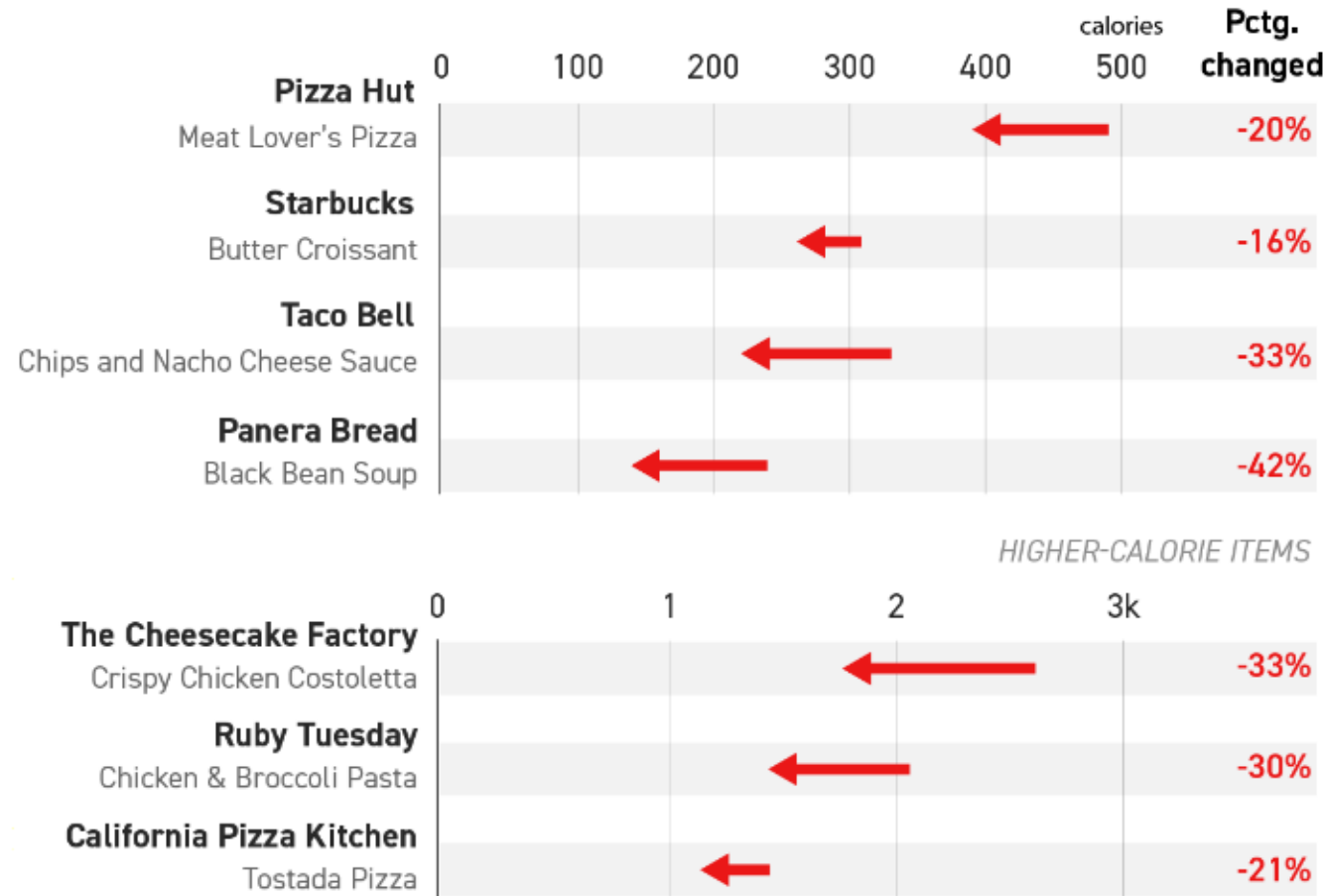
MenuStat is a free nutritional database of foods and beverages served by the nation's largest chain restaurants

Search | Graph | Export

Choose criteria to tailor search results:

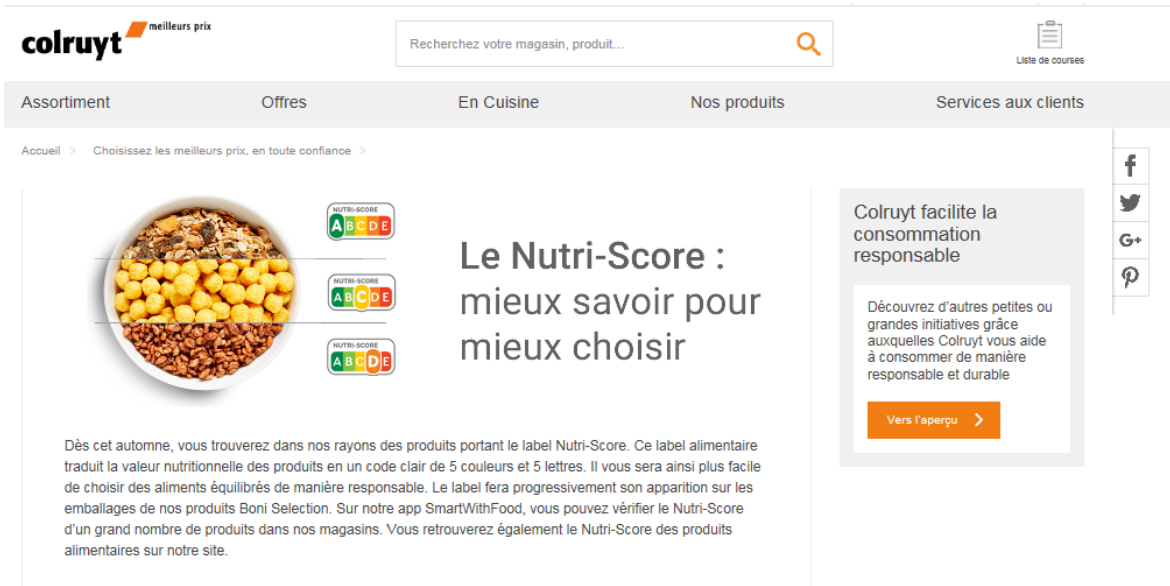
Food Categories	Restaurants	Years	Nutrients	
All Selected (12) ▾	All Selected (94) ▾	All Selected (7) ▾	All Selected (12) ▾	Search

Product reformulation, what happened in US ahead of July 2018



SOURCE: menustat.org, company websites, Center for Science in the Public Interest

Product reformulation, before and after



colruyt meilleurs prix

Recherchez votre magasin, produit...

Assortiment Offres En Cuisine Nos produits Services aux clients

Le Nutri-Score : mieux savoir pour mieux choisir

Colruyt facilite la consommation responsable

Découvrez d'autres petites ou grandes initiatives grâce auxquelles Colruyt vous aide à consommer de manière responsable et durable

Vers l'aperçu

Dès cet automne, vous trouverez dans nos rayons des produits portant le label Nutri-Score. Ce label alimentaire traduit la valeur nutritionnelle des produits en un code clair de 5 couleurs et 5 lettres. Il vous sera ainsi plus facile de choisir des aliments équilibrés de manière responsable. Le label fera progressivement son apparition sur les emballages de nos produits Boni Selection. Sur notre app SmartWithFood, vous pouvez vérifier le Nutri-Score d'un grand nombre de produits dans nos magasins. Vous retrouverez également le Nutri-Score des produits alimentaires sur notre site.

Le Nutri-Score : clair et prêt-à-l'emploi



Un label alimentaire fiable

Le Nutri-Score est un label alimentaire très clair qui vous permet de choisir plus facilement une alimentation équilibrée.



Score de A à E

Le code couleur va de vert (= équilibré) à orange foncé (= à limiter). Ces 5 couleurs correspondent également à 5 lettres : de A (= équilibré) à E (= à limiter).



DELHAIZE

Recherchez des produits ou des recettes

Nos magasins S'enregistrer ou s'identifier FR

e-Shop Promotions Vin&Bulles Recettes e-magazine Carte-plus Folder Zoom: La saison du gibier est ouverte

Chez Delhaize, mieux manger est un jeu d'enfant

Commencer les achats

Nutri-score : 5 couleurs pour vous repérer sur les emballages.



Le Nutri-Score*, ce sont 5 lettres et 5 couleurs qui résument les informations nutritionnelles d'un produit. Vous retrouvez un pictogramme bien visible à l'avant de vos emballages. En un coup d'oeil, le Nutri-Score, vous donne une vue d'ensemble qui résume les tableaux compliqués que vous n'avez pas le temps de lire. Comparer deux produits ou composer un panier équilibré n'a jamais été si facile !

*Nutri-Score est une marque déposée, développée et soutenue par la santé publique française et les pouvoirs publics français.

Plus besoin d'être expert en nutrition

Les tableaux incompréhensibles au dos de vos produits s'éclaircissent d'un coup grâce à l'arc-en-ciel de 5 couleurs et 5 lettres, bien visible à l'avant du paquet. Désormais, vous choisissez par exemple entre nos céréales, catégorisées de A à E, sans passer une heure dans les rayons !

Ceci n'empêchera toutefois pas ceux qui s'étaient familiarisés avec les tableaux nutritionnels de les retrouver comme avant sur leurs produits. Toutes les informations nutritionnelles détaillées par nutriment sont toujours présentes à l'arrière des emballages (obligation légale).



Brick-and-mortar and online choices



Le Nutri-Score :
mieux savoir
pour mieux
choisir









Grâce à notre app SmartWithFood, vous comparez d'ores et déjà le Nutri-Score de 20 000 produits

Pas encore de Nutri-Score sur l'emballage ? Téléchargez notre app SmartWithFood et trouvez facilement le Nutri-Score de produits Boni Selection ainsi que des marques connues. Scannez le code-barres du produit et le Nutri-Score s'affiche directement.



Trier par : Popularité ▼

- Promotions
- Prix/pièce
- Popularité

 <p>Delhaize Bio - Flocons d'avoine Bio</p> <p>2,98 €/kg 500 gr €1,49</p> <p>Ajouter</p>	 <p>Delhaize - Cottage cheese</p> <p>4,95 €/kg 200 gr €0,99</p> <p>Ajouter</p>	 <p>Delhaize - Yaourt Grecque Nature</p> <p>3,90 €/kg 4 x 125 gr €1,95</p> <p>Ajouter</p>	 <p>Delhaize - Yaourt Grecque 10% M.G.</p> <p>3,38 €/kg 500 gr €1,69</p> <p>Ajouter</p>
 <p>365 Delhaize - Yaourt Maigre Nature</p> <p>0,99 €/kg 8 x 125 gr €0,99</p> <p>Ajouter</p>	 <p>Delhaize - Flocons d'avoine</p> <p>2,06 €/kg 800 gr €1,65</p> <p>Ajouter</p>	 <p>365 Delhaize - Fromage frais Maigre</p> <p>1,30 €/kg 500 gr €0,65</p> <p>Ajouter</p>	 <p>Delhaize - Yaourt Entier Frai</p> <p>3,83 €/kg 180 gr €0,69</p> <p>Ajouter</p>

What empirical information we could collect

- ❖ Brick-and-mortar shopping provide purchase data, and may allow estimating the macro impact of an intervention (e.g., the introduction of a new FoP system)
- ❖ Online shopping, instead:
 - Also allows the estimation of the impact at a micro scale
 - Allows linking any impact to specific socio-demographic characteristics
 - Allows linking any impact to previous actions (e.g., did the online shopper click on the label, filter or sort products by label)
 - Etc.

Key brands already committed to "nudge for good"

The screenshot shows the homepage of the Nudging for Good initiative. At the top left is the logo "NUDGING FOR GOOD" with two smiley faces. To the right is the tagline: "Helping people to adopt healthier and more sustainable lifestyles". Further right are the logos for BVA and AIM (European Brands Association). Below the logo is a navigation menu with links: Home, Creating Nudges, Consumer Insight, Case studies, Awards, The AIM initiative, and Contact. A search bar is located to the right of the menu. The main content area features a video player with the title "Why are brands Nudging for good?". To the left of the video is a text block titled "Build sustainable brands with AIM Nudge toolkit" which describes the toolkit's purpose and includes a "Get Started" button and social media sharing icons.

This screenshot shows a tweet from Cass Sunstein (@CassSunstein) dated 11/15/16. The tweet text reads: "Want to know what Richard Thaler, 2017 Nobel prize in economics, and Cass Sunstein, both co-authors of the best seller 'Nudge' think about our Nudging for Good initiative? Read their tweets below!". Below the tweet are two replies. The first reply is from Cass Sunstein: "Nudging for good - a tool kit. (Note: @R_Thaler & I had nothing to do with this; it looks VERY impressive) @Thobava nudgingforgood.com". The second reply is from Richard H Thaler (@R_Thaler): "Can't decide what I like better. A prize for 'nudging for good' or the idea of the first winner." On the left side of the tweet is the "NUDGING FOR GOOD AWARDS" logo. Below the logo is the text: "Discover the winners of the Brands Nudging for Good Awards 2017".



Should we not join forces?

- ❖ All in all, we saw that experimental online data provide precious information on consumers' perceptions, understanding and purchase intentions. However there are both gaps and inconclusive results.
- ❖ We also saw that some concerns are cast on the external validity of such results
- ❖ We therefore make a call for researchers and the private sector to join forces to look for conclusive empirical results (regarding the effects on the demand and the supply side):
 - The previous slides offer some relatively simple ideas for future research



Thank you