Evaluation study of the WWF Sustainable Protein / Meat Guides

- *Final report* -

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REPORT PLAN – Table of content

EXECUTIVE SUMMARY

METHODS

Methods used include:

- Documentary analyses (WP0)
  - material provided by the WWF
  - websites of other NGO's with same objectives (i.e., www.sustainabletable.org.au ; www.eating-better.org; www.greenpeace.org.uk, …)
  - websites of other (international) organizations involved with meat consumption reduction (i.e., Ministry of Food, Agriculture and Fisheries of Denmark, World Economic Forum)

- Experiments
  - WP1 & WP4: 885 participants from 5 countries, mean age: 42 years-old, 52% female, 84% omnivorous and 16% flexitarians.
  - WP2: 151 French participants, mean age: 23 years-old, 67% female, 78% omnivorous and 22% flexitarians.
  - WP3: 137 participants, mean age: 28 years-old, 66% female, 66% omnivorous and 34% flexitarians.
  - WP6: 463 French participants, mean age: 38 years-old, 54% female, 77% omnivorous and 23% flexitarians.

Of note, the experimental sub-groups do not differ in terms of individual variables, which are also statistically controlled on those variables. The differences observed between the experimental groups cannot be the consequence of one of these criteria.

MAIN RESULTS

Below please find the WWF's expectations:

"Possible outcomes the WWF would like to explore: Consumer reception and acceptance, and changes in consumer knowledge and behavior, depending on the content of the guide, its format and the way it is presented. Both unintended consequences (evtl. health gains of new consumption patterns) and heterogeneous effects of different socio-economic groups should be explored (female vs male; age; students vs young professionals, young parents; ethnic origin)" .

As "executive summary", please find our responses to those inquiries and additional necessary issues analyzed to achieved those responses:

1. **What are the common claims used in/by all the WWF countries studied?**

- Environmental claim: Meat production contributes to gas emissions, eutrophication, biodiversity loss, and deforestation.
- Animal welfare claim: Meat production is strongly linked to animal suffering.
- Health claim: Consuming meat negatively impacts human health.
- Nutrition claim: Reducing meat intake and substituting it with other protein alternatives fulfills consumers' nutritional requirements.

2. **What are the current levels of meat consumption?**

Men eat more meat than women, educated people eat more meat than less educated people (appendix 2.), Austria and France eat less meat (around 6 meals in a week) than Estonia, Portugal, or Sweden (around 7 meals in a week), meat consumption decreases with age, except in France (the greater discrepancy appears between over and below 40). In all instances, it appears that consumers underestimate their meat consumption to the extent that when asked how many of their meals integrate meat per week, they most often consider butcher pieces (and not mince meat, ham, etc.)

3. **How do consumers "perceive" the guides? Is their message understood and accepted? Do they change behaviors?**

Our results lead us to consider that the guides are well perceived and the use is effective. A combination of health and environmental claims provide the best results in WWF's global communication. The combined results of WP1&4 and WP3 enable us to state that these claims do change people's behaviors: not only do they declare intentions to change their behaviors but in situation of product choices, WWF's communication lead to the selection of more vegetarian alternatives (25% more with WWF communication compared to a neutral communication).

4. **What is the impact of presenting the guide in a supermarket context?**

Our study in a virtual supermarket environment enabled us to test the effect of a WWF communication in that context by comparing it with a communication unrelated to meat-reduction. Our results show that people exposed to a WWF communication on meat reduction in a purchase environment increases their selection of vegetarian alternatives by 25%.

5. **Most effective claim per country: what is the influence of cultural dimensions and country on claims perceptions?**

The effectiveness of the claim on intentions to eat better and/or less meat depends on the country, except for Austria (among Austrians, intentions to eat better meat do not seem to

depend on the type of claim). What we found, the health claim scores first in France, Portugal, and Austria; the environmental claim ranks before the health claim in Estonia and Sweden; the animal welfare claim really depends on countries; the economic claim is most effective in Sweden, but the least effective everywhere else. Intentions to eat vegetarian alternatives vary depending on countries, but the effectiveness of the type of claim does not depend on countries.

People scoring high on masculine values, power distance and uncertainty avoidance are less likely to adapt their diet. Some countries tend to differ in their likelihood to adapt their diet (Sweden > France > Estonia > Portugal > Austria). Such differences could potentially help the WWF prioritize campaigns on a global basis, considering that in some countries people may both eat more meat and be more likely to adapt their diet.

6. **What is the influence of masculine vs feminine values in a culture on claim effectiveness?**

People scoring high on masculine values have lower intentions to change their diets.

7. **Most important elements on leaflet to influence choices: what to say on leaflets in supermarkets to change behaviors (make sure people select less meat and more vege alternatives?)**

Health arguments and environmental arguments have a positive impact on the ingredient depiction, thus resulting in a positive effect on the number of vegetarian alternative products chosen. Moreover, environmental & health arguments, as well as pictograms have a positive impact on the images viewed on the packaging, which in turn have a positive influence on the selection of vegetarian alternative products.

8. **What is the most effective way to communicate the content of the guide?**

In terms of communication media, the leaflet appears to be the most effective format to communicate the content of the guide. Beyond its superior impact on consumers' intentions to eat vegetarian alternatives compared to an app or a website, its diffusion will also enable to reach people who are not involved in the issue in the first place, while visiting a website or an app requires some involvement (willingness to visit the website or download the app).

1. PROJECT OBJECTIVES

1.1. The WWF's initial demand

Objectives

1) *Define the research approach (context, research question, outcomes & methodology) - jointly with WWF*

Main research question: Are the guides effective to change consumer behavior? The approach can be either qualitative (focus group discussions, stakeholder interviews) or quantitative, depending on the overall research approach. Possible outcomes WWF partners would like to explore: consumer reception and acceptance, and changes in consumer knowledge and behavior, depending on the content of the guide, its format and the way it is presented. Both unintended consequences (evtl. health gains of new consumption patterns) and heterogeneous effects of different socio-economic groups should be explored (female vs male; age; students vs young professionals, young parents; ethnic origin)

The overall research question can be declined in different (alternative) ways, for example:

1. How do consumers perceive the guides? Is their message understood and accepted? Do they affect their behavior?
2. What is the most effective way to communicate the content of the guide? App versus webpage versus targeted seminars presenting the guide etc.?
3. What is the impact of presenting the guide in a supermarket context? Impact on consumer knowledge/ supermarket sales' figures etc. (evtl. think of a collaboration with an international supermarket to set up an experiment in the different countries)
4. What is the impact of presenting the guide in a restaurant/public meal setting? (e.g., to capture how consumers perceive being guided by restaurants and retail through choice editing using the guides)

2) *Collect the data - in collaboration with and the support of the WWF country offices*

3) *Clean, & analyze the data - research team alone*

4) *Write up a summary report + academic - publishable - paper with main conclusion*

Deliverables

- 1 peer-review scientific publication, in which Eat4Change DEAR funding is explicitly acknowledged
- Summarized report and divulgative powerpoint on the main findings, that is easily understandable by both a scientific and non-technical audience.
- Presentation of finding to seminars and workshops (both internal to WWF and external with key stakeholders)

1.2. Proposal (validated on 10 October 2022)

The WWF's main research question was "Are the guides effective to change consumer behavior?". However, considering that the WWF is not questioning the relevance of pursuing societal communication to reduce/improve meat consumption, but rather to optimize its effectiveness, it was decided in agreement with the WWF, not to evaluate the effectiveness of each country's actions against no communication, but rather to set up experimental protocols that compare the effectiveness of (1) each type of claim, (2) various execution of the claims, considering cultural dimensions and differences that provide depth to our results.

Such an empirical solution, developed in agreement with the WWF, made it possible to compare countries, obtain generalizable results and to extend them to countries that were not tested, based on results that integrate intercultural differences.

In the end, 7 work packages have been proposed, but the last one, that concerned the development of a gamified application and originally appearing as "to be confirmed", was finally not included in the project.

	Actions	Means	Timing
WP0	A) **Situation analysis** – Ok with WWF on countries and specific objectives B) **Content analysis** : identify main "arguments" supporting the proposition towards more sustainable protein	A) whole team Lead : Karine Charry Support : Fatma (researcher)	A) October B) October/November +/- 2 months
WP1	**Quantitative analysis** of arguments (identified in WP0) effectiveness + potential other arguments (< literature) +/- 200 people/country (consider different age groups, levels of involvement in the issue, gender, etc.) Age groups considered : 1 (youth : 18-35 yro) + 2 (older adults)	Whole team + recruitment bureau	WP1 & 4 Conducted simultaneously +/- 2 months + winter/xmas break -> Mid/end February
WP4	**Quantitative analysis** of cultural influences 6 countries will be considered in the study (Belgium, Estonia, Sweden, Austria, France, Portugal).	Whole team + recruitment bureau	
WP2	**Format analyses** Development and test of re-worked propositions based on - WP1 - WP4 - Communication literature (ELM, Systems 1&2, ..) *RQ : forced exposition* Propositions include the following formats - Leaflets - Apps - Websites Experiment on students (validate recall, impact, understanding) -> target = youth (18-35 yro) Additional online survey to investigate format preferences according to different age groups -if relevant/possible.	UserLab (Université Angers) Lead : Fanny/Gaelle	+/- 3 months (March, April, May)
WP3	Test in situ (**VR**) supermarket/ restaurant (TBC) to increase *external validity* - levels of deliberate attention to info provided (volitional) - levels of attention to specific arguments/visuals (**eye-tracking**) - impact on types of proteins purchased (more sustainable or not) : shopping cart content analysis	Lead : Fanny/Gaelle UserLab Université Angers	+/- 3 months (June, July, August) + summer break September
WP5	Dissemination 1. Report 2. Publication in peer-reviewed journals 3. Presentation to stakeholders		1. October 2023 2. Submission based on the report -> post report. 3. Min 1 max 3; dates TBD, post report.

1.3. Adjustments to the validated proposal

Considering the options still open in the proposal approved on 10 October and the results obtained as the work was progressing, the proposal was adapted in **4 directions**. Decisions and their justifications are proposed below:

First, after discussion with WWF, the **list of countries** originally considered has been **reduced to 5** (deletion of Belgium as Belgium presents a double culture that doubles data collection requirements while its cultural specificities are somewhat encompassed in other studied countries and can be -to some extent- extrapolated).

Second, as results of WP0 pointed to additional relevant levers (to type of claims): traffic light, recipes, humor and the various types of representation of the animal in the communication, we considered those were worth evaluating, to **add to the "claim" recommendations "framing" ones** (how should the communication "look" like). In this last respect, three types of representation emerged for live animals: (1) pictograms/drawings, (2) in battery cages or (2) in the meadow, each being presented with or without a picture of the animal in its state of consumption (i.e., as a steak). We therefore added a wave of experiments to test these specific elements in a single country. In the remainder of this report, we will refer to this extra experimental wave as WP6.

Third, in WP2, to thoroughly examine the impact of various formats (Leaflet, App, Website) we eventually **opted for face-to-face interactions** rather than online studies. Beyond adding "ecological" validity to our study (strengthening our results through the addition of data collection methods), this appeared as the relevant way to compare the various media. This study indeed looked at the media/channel characteristics (and not the content characteristics as in WP1 and 4), and some media -in the absence of virtual reality, can *only* be fully experienced and evaluated IRL (notably the leaflet), while real-life does not impair participants' ability to experience digital tools. It seemed appropriate to test those media in face-to-face interviews, also considering that the most important target (as agreed in the proposal) was young individuals aged 18-25.

Fourth, in WP3, it was decided to **focus on the supermarket context** (instead of restaurant). This seems a more realistic context (a more plausible context, when considering where to offer informative leaflets to consumers, as compared to restaurants). Furthermore, restaurant consumption often represents "out-of-the ordinary" meals, where individuals tend to try and consume products they do not cook at home on an everyday basis. Restaurants may also represent a more festive time where people want to enjoy the moment without restrictions or constraints. This might not be the most representative context while trying to evaluate people's effective consumption choices and changes (products based on animal vs. plant proteins).

2. PROJECT MANAGEMENT

2.1. Project identification

Project title	TOR - Evaluation study of the WWF Sustainable Protein / Meat Guides (Output 4.3.2)
Project coordinator	Karine CHARRY (Professor, UCLouvain)
Project period	10th of October 2022 - 29th of February 2024

2.2. Key milestones in the project timeline

- **10 October 2022**: Validation meeting of the WP's of the initial proposal
- **26 January 2023**: Presentation of WP0 results and validation of the protocol of WP1/WP4, WP2, WP3 and of the extra experiments (not in the initial proposal)
- **11 April 2023**: Validation of the empirical elements for WP1 and WP4
- **4 October 2023**: Presentation of the results of WP1, WP4 and WP2

2.3. Research team

Name	Status	Leading role in WPs
Karine CHARRY	Professor, UCLouvain	WP0, WP5
Béatrice PARGUEL	CNRS Research Director	WP1, WP4, WP5
Gaëlle PANTIN-SOHIER	Professor, Université d'Angers	WP2, WP3, WP5
Fanny THOMAS	Associate Professor, Université d'Angers	WP2, WP3, WP5

To be noted, Fatma JAAFER intervened on WP0 as a research intern under the supervision of Karine CHARRY. We thank her for her support analyzing the enormous amount of data offered by WWF teams.

3. RESULTS BY WORK PACKAGE

WP0 : Documentary analyses

Objectives

- Identify the types of claims used in different meat/protein guides;
- Identify other potential interesting elements that could be further tested to enhance meat guides effectiveness (see our proposals of experimental extensions further);
- Identify a "lowest common denominator" guide to be used as the experimental setting to be used in the forthcoming experiments.

Method

A content analysis was conducted on the “Meat guides” developed in the 5 countries of concern. The meat guides are the communication material developed by the WWF to offer “easy-to-understand” information about the complex environmental impacts of meat production and consumption, accessible to consumers. Their final objective is to stimulate choices reducing environmental impacts of current meat consumption (Röos et al., 2014).

- Step 1. WWF meat guides from Sweden, Estonia, Austria, Finland, and France were downloaded (leaflet or website versions) and translated to English.
- Step 2. A detailed coding grid was created to analyze the content of the guides according to specific codes: type of claim, iconography, signal system, tone, gamification, numbers, solutions / recipes.

The table below summarizes the condensed info in the coding grid:

Meat Guide	Swedish	Estonian	Austrian	Finnish	French
Year of launch and up-dates	2015,2016,2019,2021	2020	2019,2021	2017	2019
Language	Swedish	Estonian	German	Finnish	French
Type of food evaluated	Beef, Lamb, Pork, Chicken, Game, Egg, Cheese, and Plant-based protein	Pork, Beef, Lamb, Chicken, and Game	Pork , Chicken, Turkey , Beef , Lamb and game and plant-based alternatives	Plant-based protein alternatives, meat, fish, dairy products , fruit and cereals	Meat (beef, lamb, chicken, Turkey and duck) and milk (of cows, goats and sheep)
Environmental sustainability criteria	Biodiversity, Climate, chemical pesticides, animal welfare and antibiotics	Climate, pesticides use, biodiversity, eutrophication	Climate, biodiversity, pesticides, over-fertilization, antibiotics, animal welfare	No specific were mentioned.	Climate , biodiversity, eutrophication, pesticides and animal welfare
Signals system	Traffic light system (3 colours: green, yellow,red)	Traffic light system (3 colours: green, yellow,red)	Traffic light system (3 colours: green, orange,red)	No signals system used	Traffic light system used in the report, but the meat classification on the website was based on the sustainability labels.
Gamification	Food calculator	Food quiz	Superpower challenge	No	Application : WAG: we act for good
Recipes	No	Yes	No	Yes	Yes
Arguments	Environmental argument,Health argument, Nutrition argument,	Environmental argument,Health argument, Nutrition argument	Environmental argument,health argument, regulation argument	Environmental argument, health argument, nutrition argument	Environmental argument, animal welfare,Health argument, nutritional argument , Economic argument
Solutions	*Reducing Meat consumption *Eating more legumes and vegetables *Eating better meat (eco-labelled meat) *Reducing food waste	*Reducing Meat consumption *Eating more legumes and vegetables *Eating better meat (eco-labelled meat) *Recommended quantity per person per week (No more than 500g: 400 g of poultry and 150g of red meat)	*Reducing Meat consumption *Eating more legumes and vegetables *Eating better meat (eco-labeled meat) *Recommended quantity per person per week (reducing the current meat quantity by 70%)	*Reducing Meat consumption *Eating more legumes and vegetables *Eating better meat (eco-labelled meat) *Plant-based protein alternatives to replace meat were mentionned *Recommended quantity per person per week (100 g of red meat and 200g of light meat) *Recommended frequency of meat consumption during a week (2 days light meat and one day red meat)	*Reducing Meat consumption *Eating more legumes and vegetables *Eating better meat (eco-labelled meat) *Plant-based protein alternatives to replace meat were mentionned *Recommended frequency of meat consumption during a week (3 days without meat a week)
Numbers	*Average amount of meat consumed per person per week (1kg) *Recommended quantity of meat consumption per person per week (No more than 500g) *The impact of meat production on the environment	*Recommended quantity per person per week (No more than 500g: 400 g of poultry and 150g of red meat)	*Average amount of meat consumed per person per week (1200g) and per person per year (59kg) *Recommended quantity per person per week(reducing the current meat quantity by 70%) *The impact of meat production on the environment	*Average amount of poultry consumed per person per year (from 13 Kg in 2000 to 26Kg in 2019) *Average amount of cheese consumed per person per year (from 17 Kg in 2000 to 25Kg in 2019) *The impact of meat production on the environment	*Numbers of animals killed each year to be consumed *Recommended frequency of meat consumption during a week (3 days without meat a week) *The impact of meat production on the environment

- Step 3. Other meat guides and guidelines from Germany, Australia, the UK and Denmark were considered as benchmarks.

Results

Meat guides FORMAT

- To the exception of Sweden who also proposes a printed version, all meat guides are **exclusively available online** (websites). Additional tools are nevertheless offered:
    - App (Sweden)
    - Gamified tools (Sweden) that calculates meals impacts
    - Videos (Sweden, Estonia)
    - Recipes (Estonia, Finland, France, Sweden,..)
    - Quiz (Estonia)
    - Cooking session (Estonia)
    - Challenges (Austria)
    - Interactive sessions with the WWF experts (Austria)
    - Newsletter (Finland)
- **Signal systems** are often used and always use a 3 color-traffic light format.
- Most of the meat guides use lots of specific figures, such as the Austrian meat guide:

    59 kg *of meat are eaten per person in Austria in one year. Austrians eat an average of almost* ***1200g per week. 43%*** *of food-related greenhouse gas emissions are attributable to meat. About the recommendations of the Ministry of Health, it turns out that we eat about* ***three times as much*** *meat as recommended. Globally,* ***21 to 37%*** *of total greenhouse gas emissions are attributable to our food system. Our diet is responsible for* ***70%*** *of biodiversity loss and* ***80%*** *of deforestation worldwide. Meat and dairy products account for* ***23%*** *of food consumption but generate* ***67%*** *of food-related greenhouse gas emissions in Austria. The production of animal foods also consumes a lot of space. The production of* ***1 kg*** *of pulses takes up an average of* ***3.6 m2*** *of land****, 1 kg of beef 46 m2*** *of land – which is about 13 times the area. A healthy diet was defined in this study as a significant reduction in meat consumption* ***(–70% of the current amount)*** *and a moderately reduced consumption of dairy products* ***(–20%).*** *Overall, a more plant-based diet can reduce food-related greenhouse gases by* ***22%****!*
- Regarding **iconographic choices**, animals appear in different forms, such as pictograms, pictures of real animals in different settings: in the meadow, in batteries, or as a meat product (either as a steak or as a meat carcass). Compared to what is done in Australia, the WWF does not use pictures that arouse disgust when the animal welfare argument is used.

Of note
Scientific literature demonstrates the effectiveness of many of those elements, such as the traffic lights as nudges (Cadario & Chandon, 2020), framing information using meaningful numbers (Cadario, Parguel & Benoit-Moreau, 2016), increasing self-efficacy (people's perception that they are capable of taking action, that their actions will be effective) and overcoming habits and barriers to behavioral changes with tools (Bandura, 1997) such as recipes, reducing psychological distance between the animal and the consumption products (Wang & Basso, 2019), which stresses the relevance to those, and supports the need to specifically study them in this project.

Meat guides CLAIMS

All the guides invite consumers to eat less and better meat. They never urge consumers to stop eating meat.

More specifically, four main types of claims appear in the meat guides:

- Environmental claim: Meat production contributes to gas emissions, eutrophication, biodiversity loss, and deforestation.
- Animal welfare claim: Meat production is strongly linked to animal suffering.
- Health claim: Consuming meat negatively impacts human health.
- Nutrition claim: Reducing meat intake and substituting it with other protein alternatives fulfills consumers' nutritional requirements.

Additional arguments appear more anecdotally:

- Economic claim: Consuming less meat decreases one's food budget as vegetables and legumes are less expensive than meat. While respecting consumers' buying power, these savings enable the consumption of better meat.

  This argument is used in France but seems a concern (at least) in Sweden and Austria too, where additional studies were conducted on the matter.

Of note:

The economic argument is also often used by other environmental/economic organizations to reduce meat consumption, whether at the individual or global level (World economic forum, 2018[1]).

The scientific community also endorses the argument: a no-meat diet (balanced flexitarian, pescatarian, vegetarian, and vegan diets) is evaluated 20 to 25% less expensive than meat-based diet in upper-middle-income to high-income countries on average (Springmann et al., 2021) and plant-based consumers, particularly vegan, are associated with lower food expenditures compared to omnivorous consumers (Pais et al., 2022). The cost argument is also considered as a motivation to eat less (Kemper et al., 2023).

- Regulation claim: Production of unprocessed meat is unregulated (only present in Austria).
- Social claim: Organic meat production might positively impact the preservation of heritage communities.
- Austria questions the relevance of focusing more specifically on the promotion of a plant-based diet (in comparison with a com that promotes mainly a lesser/better meat diet).

Conclusion

- Our analysis enabled us to identify the **3 main claims/arguments to be tested** in the forthcoming experiments, as they are claims common to all countries (all countries acknowledge their relevance). It should be stressed that following up on WWF's suggestion, the **health and nutrition claims will be aggregated** as the nuance is subtle. We **add the economic claim/argument** as this seems a relevant additional argument and a source of concern for some WWF teams.
- Communications mainly promote a "less and better" meat diet, although detailed arguments behind the claims offered suggest systematically eating more vegetables and legumes.
- Framing/illustrative elements recurrently appear in the guides, such as
    - representations of the animal (being either drawings/pictos, pictures – in battle, in meadows, in the form of steaks),
    - traffic lights,
    - humor,
    - figures to support the claims,
    - recipes

[1] https://www.weforum.org/agenda/2018/12/vegetarianism-is-good-for-the-economy-too/

GENERAL COMMENTS RELATIVE TO EXPERIMENTAL PROCEDURES AND RESULTS

1. Visuals used in the experiments

Please note that the visuals used in the different experiments were created to serve the specific purposes of the experiments. They are not official WWF documents.

2. Statistical data analyses

To ensure that this report would be readable, we opted for the option that consists in not providing all numbers and results of all statistical analyses performed on the data.

Should readers request them, they will be provided, in accordance with article 8.5 of the contract agreement.

In all instances, readers should be confident that unless specified, results are statistically significant at $p < .05$, which is the reference commonly accepted by the scientific community. Concretely, this means that there is less than 5% chance to make an error when stating that the differences observed between our groups of participants can be extrapolated to the a population.

3. Scientific references

To offer more perspectives on our results, we provided additional insights from academic research that seem relevant to the point. References are usually provided but should one be missing, please do not hesitate to turn to us for further info. Should you not have access to some, we will also try to make those available to you, as we know it is not always easy to access scientific research.

WP1 (claims effectiveness) & 4 (cultural and country specifics)

Method

WP1 and WP4 were conducted in the same wave of experiments. To test the cultural perspective, we integrated a "dual level" of cultural variance in the evaluation of claims effectiveness. The first level of cultural variance is the country, the second level is the differences among individuals within a culture (i.e., differences in terms of cultural values / cultural orientation).

The experiment adopts a **4 claims x 5 countries "between-subjects" [2] design**:

- 4 types of claims: environment (climate, biodiversity), nutrition (effectiveness of a diet based on alternative proteins)/health (pesticides, antibiotics), economic, animal welfare ⇒ one type of claim is tested at a time in each country to isolate the net effectiveness of each type of claim (see Figure 1).

Visuals created for the experiments (not official WWF documents) on claims manipulations[3] (French version)

Environment	Health	Animal welfare	Economic
			

[2] Between-subjects experimental designs expose participants to one and only one element (here the claim). As such, participants are assigned to one group or condition (i.e., one of the claims). Comparisons on the variable of interest (DV) are made based on the means of each group. Participants being randomly assigned to a condition, it is expected that groups will be equivalent on other characteristics that could influence the results, such as age, gender, education, environmental consciousness, and as such, cannot explain results. Group similarity will nevertheless be controlled for in the analysis.

[3] "Manipulation": the specific leaflet that was created to expose respondents to each type of claims.

- 5 countries (i.e., Sweden, Austria, France, Estonia, Portugal) to test potential cultural influences on the effectiveness of the type of claim.

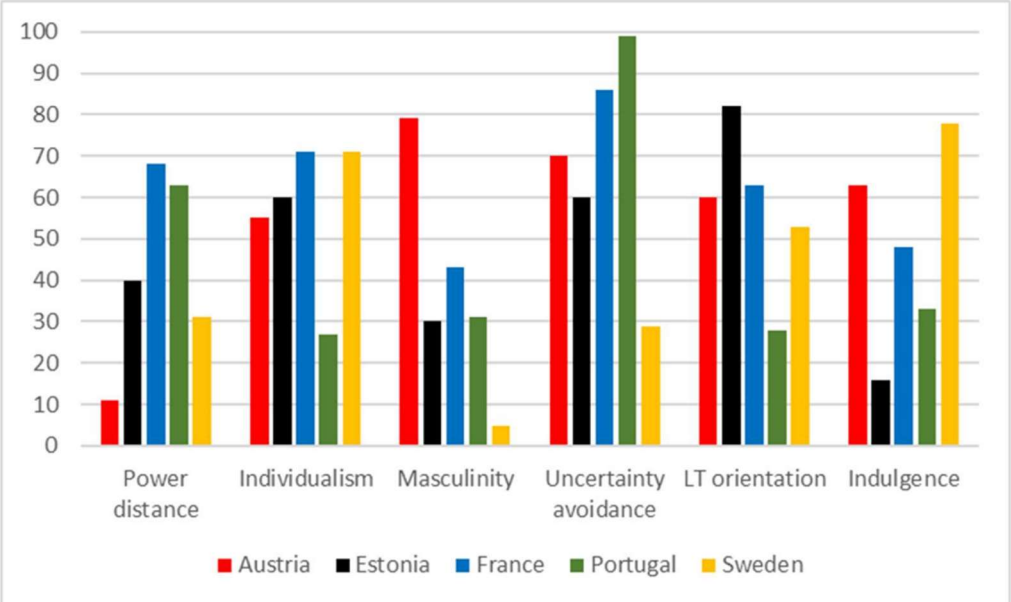
Of note

Culture, that draws the cultural influences impacting our attitudes and behaviors, is usually defined as "the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, 2011, p.3). "Societal cultures reside in (often unconscious) values, in the sense of broad tendencies to prefer certain states of affairs over others" (Hofstede, 2001, p. 5). It may therefore be considered at a collective (national) level but also be at the individual level in terms of its cultural dimensions. Hofstede (2001) proposes the following 6 dimensions to differentiate cultures:

- Power Distance, i.e., the extent to which the less powerful members within a country expect and accept that power is distributed unequally,
- Uncertainty Avoidance, i.e., the extent to which the members of a culture feel threatened by uncertain or unknown situations,
- Individualism/Collectivism, i.e., the extent to which, in each society, individuals are expected to autonomously take care of themselves and immediate family,
- Masculinity/Femininity, i.e., the extent to which the dominant sex role pattern is the male one,
- Long/ Short Term Orientation, i.e., the extent to which people's efforts focus on the future or the present and past, and
- Indulgence/Restraint, i.e., the extent to which people focus on the gratification versus control of basic human desires related to enjoying life.

Interestingly, the 5 countries investigated display variance in terms of the cultural dimensions measured by Hofstede, as shown below.

Hofstede's dimensions of national culture in the tested countries



The questionnaire has first been written in English (see Appendix 1), then was sent to the WWF local teams for translation.

The questionnaire was introduced as a survey of consumers' eating habits. After collecting participants' informed written consent and measuring their weekly frequency of meat meals, we invited them to take a close look at the WWF leaflet on the impact of meat consumption.

Measures (questionnaires are provided in appendix)**:**

Marcus et al. (1994) stages of change scale was used to measure **intentions to reduce unsustainable meat consumption** and adapted to encompass **three objectives, i.e., adapt one's diet towards eating better meat; adapt one's diet towards eating less meat and adapt one's diet towards eating more vegetarian alternatives**. Precisely, participants were asked to click on the answer that best describes their position among 5 alternatives, from "I do not plan to adapt my diet to eat better quality meat / less meat" to "I adapted my diet to eat better quality meat / less meat more than 6 months ago." **In other words, this means that respondents indicating a score different than 1 intend to change their diet for "the better" to some extent. The higher on the alternatives, the stronger the adaptation**.

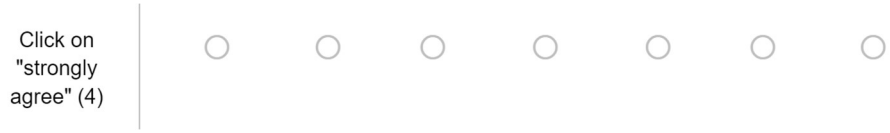
We also measured **health consciousness** (Yamim et al., 2020), **price consciousness** (Sinha & Batra, 1999) and **environmental consciousness** (Lindeman & Väänänen, 2000) to be used as attitudinal control variables.

Last, we collected participants' **cultural values** using items extracted from Yoo et al.'s (2011) CVSCALE, age, and gender. All Likert items were measured using 7-point scales. The constructs displayed good psychographic qualities.

Questionnaires were distributed through 2 different professional panel institutes to individuals eating meat (omnivore or flexitarian). Some unexpected difficulties emerged while carrying out this experiment and extended its duration:

- Translations and validations of stimuli visuals (size of logo, choice of scales...) took significantly more time and coordination efforts than foreseen and significantly delayed the launch of the data collections.
- Ensuring the quality of responses (measured through "attention check" and "manipulation checks" - see below) forced us to remove respondents throughout the data collection processes and therefore to extend them to reach the required level of valid responses.

Attention check



Manipulation check

What argument did the WWF information brochure you were exposed to put forward to encourage you to adapt your meat consumption?

o The environment (1)

o Money (2)

o Health (3)

o Animal welfare (4)

o I don't remember (5)

Participants

In all the experiments presented in this document**, we only retained answers from the respondents who knew the WWF (if only by name),** not to bias our results due to an unknown source, **and who checked the attention and manipulation checks**. For WP1/WP4, we eventually worked on 885 valid questionnaires from individuals (see Table below for the breakdown by country, age category and type of claim).

Sub-samples broken down by age category

	YOUNG	OLD	
Austria	100	80	180
Estonia	66	60	126
France	131	111	242
Portugal	101	81	182
Sweden	61	94	155
	459	426	885

Of note

For all the questions that come after the experimental manipulation that compare claims (which is the heart and most important part of our studies), we do not search for "representativeness" or, in other words, to obtain a picture that is representative of all types of individual/people's answers, but rather to compare responses according to the main claim and how those responses differ depending on the message they are exposed to. Accordingly, we do not use descriptive stats (which merely describe or "take a picture" of the situation) but inferential stats, which allow us to extrapolate our results on larger populations. For these types of research based on inferential stats, research (notably in psychology, marketing, etc.) considers that 30 respondents by experimental condition is the sufficient/required level of "observations" to be able to offer reliable results. As such, when stating that differences are "statistically different" in the remaining of the report, this means that there is less than 5% chance to make an error when stating that, extrapolated to the population, the results show what we expected.

As can be seen in the Table above, we reach a much higher number of observations in each country, which strengthens the robustness of our results.

Then, it is correct to consider that, for the control variables measured before the experimental manipulation, those responses are not representative of the population but merely indicative. Yet, this enables us to demonstrate the soundness of our samples and to provide context to our results (as for instance, the frequency of meat-based meals consumption). But again, as they are not the main objective (which is to compare and prove differences), this does not impair the quality of our results but provides nuances to them.

Sub-samples broken down by type of claim

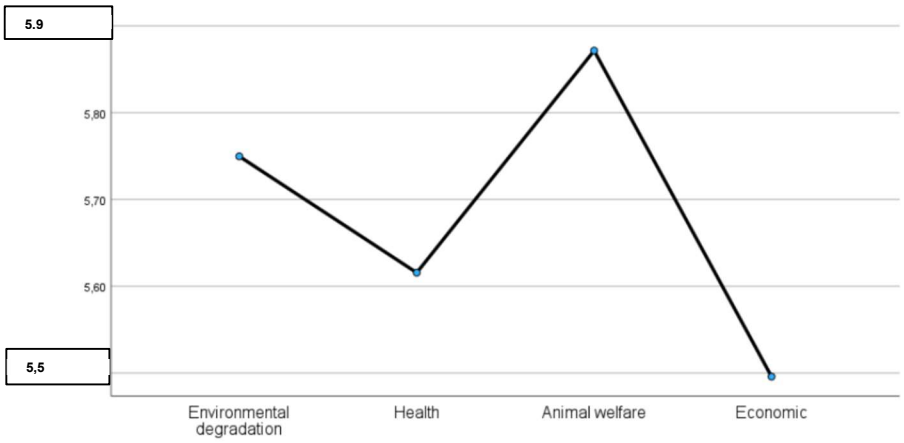
Environmental degradation	249
Health	248
Animal welfare	267
Economic	121
Total	885

The 4 types of claims were randomly presented, such that each type of claim was equally presented in each country. Interestingly, the above table shows that respondents exposed to the "economic" argument are the ones who show the greatest difficulties in correctly identifying this argument as the one presented to them (see the aforementioned manipulation check).

Of note

We doubt that this is due to the “originality” (surprising, unconventional, counterintuitive) of the argument. This characteristic usually induces better memorization (when something unexpected happens, it tends to grab our attention, and this heightened attention can lead to better encoding of the information into memory, in other words, we remember better what's surprising, Lyew et al. 2023, Mapstone et al. 2010). Furthermore, regarding the validity/credibility of the economic argument, we have no reason to consider it has been perceived “invalid / unrealistic / non credible”. The graph below shows that respondents considered it to be “truthful” (on average, 5.5 out of 7). It is (statistically[4]) considered as truthful as the health and environmental argument (no significant differences between 5.5, 5.65 and 5.75), while animal welfare was considered more truthful.

Various claims' perceived credibility[5]



It should be stressed again, that the economic argument did not state "it is less expensive to eat better meat", but "if you reduce meat consumption, you can eat meat of better quality and more alternative proteins, which helps you save money". In any case, it doesn't seem to be an effective argument to use in the WWF's communication.

Learning

All claims presented as WWF communication are considered credible by respondents, because claims perceived credibility first result from the attitude towards the WWF, which is high. The animal welfare claim is the most credible.

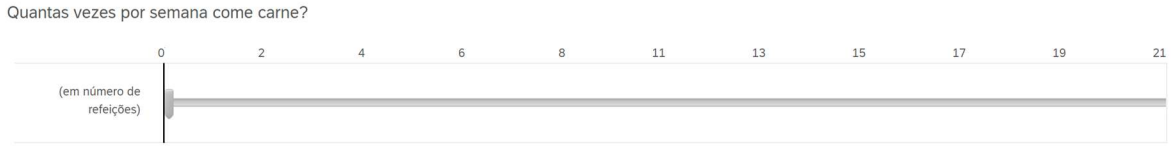
Results

1) Factors measured before the exposition to one of the 4 claims.

Some variables were measured before the experimental manipulation (exposure to one claim), as such, they are merely "descriptive" of the population and were not influenced by the manipulation. Among those variables, the frequency of meat consumption prior exposure ("how many times a week do you eat meat, all meals considered", thus varying from 0 to 21 – 7 days x 3 meals) is measured to nuance our results based on this element.

The frequency of meat consumption was measured as follows:

[5] Graphs scales differ from one graph to the next. We invite readers to always pay specific attention to the y axes that offer different intervals. As an addition, as our objective was to show differences among groups depending on the argument use, we did not need to measure any baseline (vs. doing nothing). Our discussions indeed lead us to consider that what was most helpful to the WWF was to show the most effective claims and not merely whether each is better than doing nothing (considering that the WWF will keep its communication and behavioral changes efforts). As such, we can show what claim is most effective: what arguments provide the most important changes in what country. That being said, considering that we measure stage of change, in other words, the extent to which people are ready to change after exposure to each claim, one can consider that a respondent positioning himself on step 2 already represents positive results (level 2 indicating an "intention to act in the future").



Other control variables and their influence on meat consumption before exposure to claims are as follows:

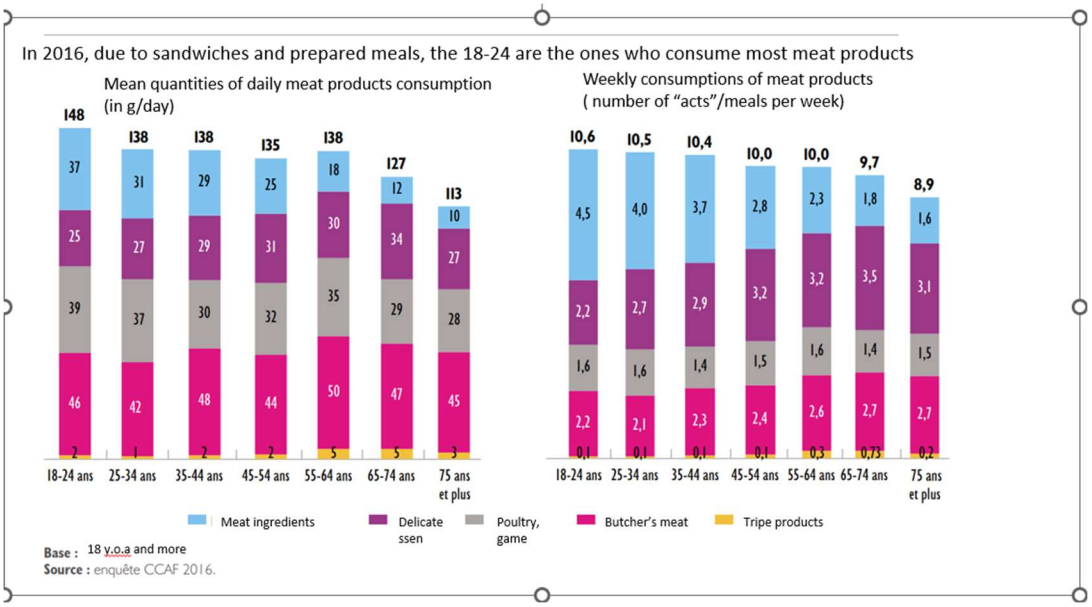
- **Gender**: men eat more meat than women.
- **Education**: educated people eat more meat than less educated people. See APPENDIX 2 for further details**.**
- **Country**: Austria and France eat less meat (around 6 meals in a week) than Estonia, Portugal, or Sweden (around 7 meals in a week). See APPENDIX 2 for further details.
- **Age**: meat consumption decreases with age.
    - Except in France, which makes it an appropriate candidate for further experiments to control for the influence of age.
    - The greater discrepancy appears between over and below 40 (up to 3 more meat meals a week in Austria).

Of note

Younger people eating more meat was counterintuitive for us, but different sources[67] tend to confirm this idea, at least in France, and therefore support our findings. In particular, a survey from the CREDOC in France confirms that younger people consume more meat than any other age group and provides information on the frequency of meat consumption in a week. In 2016, it was between 8.9 times (18-24 y.o.a) and 10.6 times (75+) a week, with a reduction of almost 2 points in a decade.

[6] https://cultureviande.eu/ce-sont-les-jeunes-qui-consomment-le-plus-de-viande-credoc/ « En France, ce sont les jeunes qui consomment le plus de viande, grâce au succès des sandwichs, kébabs, burgers et pizzas ».

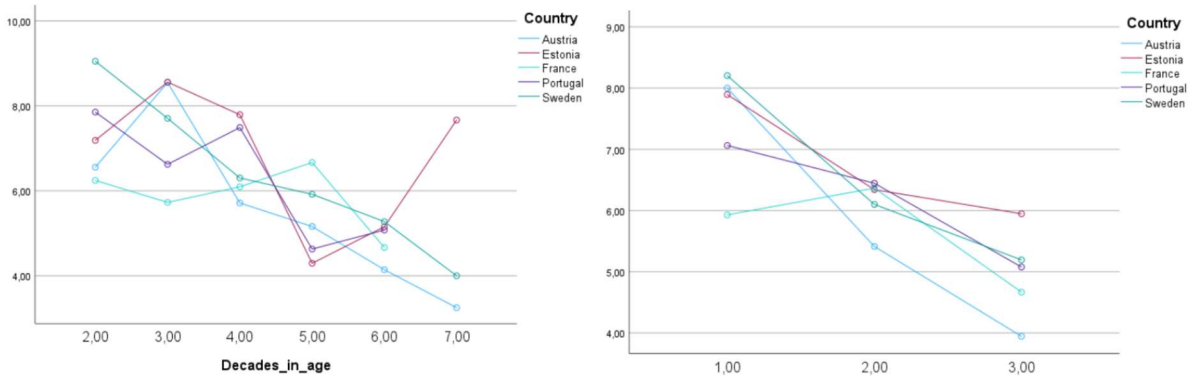
[7] Selon les résultats du sondage, "les plus gros consommateurs, c'est-à-dire ceux qui en mangent au moins une fois par jour, sont à retrouver chez les hommes, les plus jeunes (18-24 ans) et les parents. Les consommateurs plus modérés, quelques fois par semaine ou moins souvent, sont davantage des Français de 50 ans ou plus."



If our own respondents did not consider "(transformed) meat products/meat ingredients" in their response (for example, did not consider the ham in the sandwich or on the pizza but only considered the piece of meat on hot meal plate), these figures are consistent with those collected in France, as such demonstrating the robustness of our data collection. Yet, these numbers indeed underestimate the amount of meat consumed overall and support the idea that consumers are not totally aware of how much meat (hence the quality of meat) they consume.

Our data do not specifically allow us to identify the age bracket where consumption is the highest. The first graph below considers meat consumption frequency per 10-year age groups for France. The second one displays meat consumption frequency for people below 40 y.o.a (1), then between 40 and 59 (2), then above 60 (3).

Influence of age on meat consumption



In France, people younger than 40 appear to eat less meat than elsewhere, but after 40, they consume meat in a very similar way to what is observed in other countries. Another surprise concerned Swedish young people who did not appear as the most sensitive to the meat issue (considering Greta's impact).

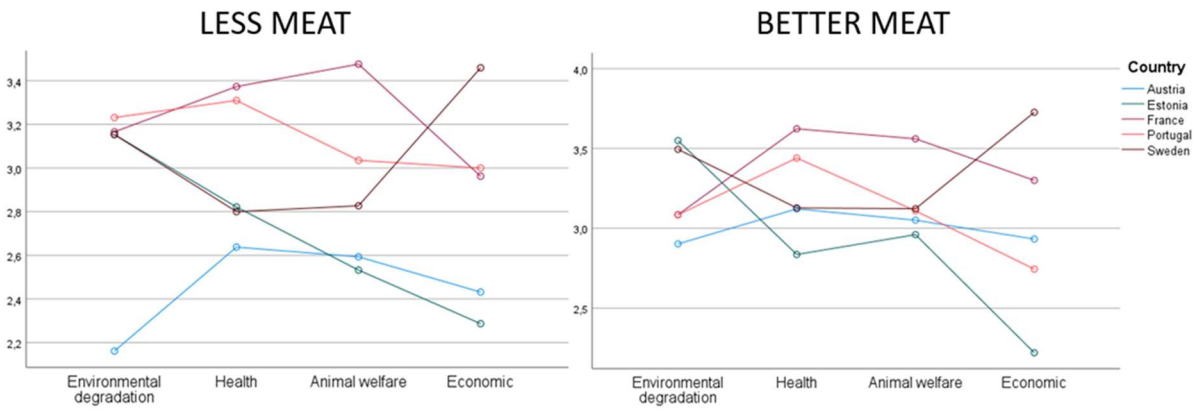
Learning:

Regarding meat consumption, men eat more meat than women, educated people eat more meat than less educated people, Austria and France eat less meat (around 6 meals in a week) than Estonia, Portugal, or Sweden (around 7 meals in a week), meat consumption decreases with age, except in France (the greater discrepancy appears between over and below 40).

2) Main results on claims' effectiveness

A significant interaction effect shows that the effectiveness of the claim on intentions to eat better and/or less meat depends on the country, except for Austria (Austrians do not seem to be more sensitive to one argument or the other to declare intentions to eat better meat – the blue line is rather flat).

Figure X. Effects of claims on the intention to eat less meat / to eat better meat



Of note

The effect of the "economic" argument on the intentions to eat better meat may come as surprising, as intuitively, better meat is more expensive than less qualitative meat. Yet, it should be stressed again that in the communications presented to respondents, "less and better meat" were systematically combined when developing the arguments. Specifically, when considering the economic one, we stressed that eating less meat and more vegetables would globally reduce the cost of one's diet, which may enable the purchase of better meat. As such, asking respondents whether the economic argument would influence their intentions to eat (1) less meat (2) better meat and (3) vegetarian alternatives, separately, appears relevant and appropriate.

Learning:

- the health claim scores first in France, Portugal, and Austria;
- the environmental claim ranks before the health claim in Estonia and Sweden;
- the animal welfare claim really depends on countries;
- the economic claim is most effective in Sweden, but the least effective everywhere else.

The effectiveness of the claim on intentions to eat better and/or less meat depends on the country, except for Austria (among Austrians, intentions to eat better meat do not seem to depend on the type of claim).

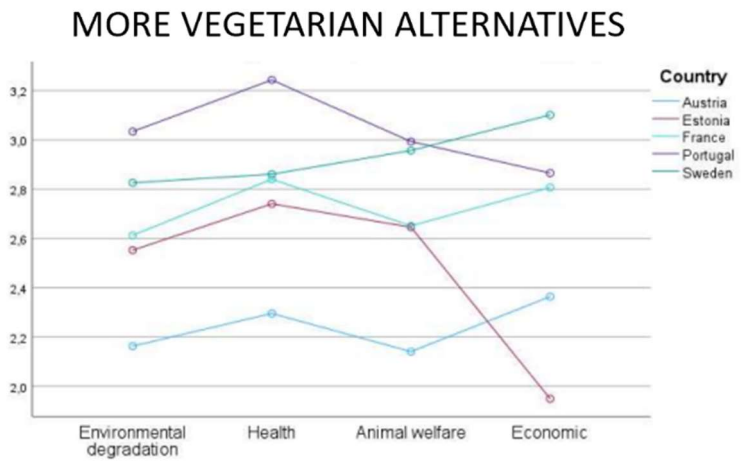
Intentions to eat vegetarian alternatives vary depending on countries, but the effectiveness of the type of claim does not depend on country.

Learning:

The economic claim is not distinctive from the others and appears difficult to remember for the respondents. It would be interesting to explore further respondents' perceptions of "meat consumption expensiveness" depending on the country, especially in regards with their social representations of "eating better meat". In any case, its effectiveness varies way more than the effectiveness of the other ones; it doesn't seem to be an effective argument to use for the WWF when promoting better meat consumption but could be relevant when promoting less meat consumption.

When considering all countries, we observe that countries (each represented by a line) have overall higher or lowers intentions to eat vegetarian alternatives (some lines representing intentions to eat are higher than others) but when considering one country in particular, the different claims do not seem to impact differently intentions (little variance on each line, the lines are rather "flat"). In other words, while communicating induces intentions to eat vegetarian alternatives, no claim is more effective than another one within a country. This is to the exception of Estonia where the economic claim has an impact below all results.

Figure X. Effects of claims on the intention to eat more vegetarian alternatives



Of note

The effectiveness of the economic argument varies way more than the effectiveness of the other ones. Here are some routes for explanation (but merely tentative):

- the variance in the price of meat in the different countries studied;
- the existence of different social representations of "meat consumption expensiveness" depending on the country (NB: If this question about what "better meat" means for consumers is of importance, this would call a small but specific spin-off research in different countries.

Looking at the Swedish case and trying to explain its original results, it can be expected that the argument works best in a country where people show a particular interest on the question (cf. "people google a lot on 'why food is expensive'" that was mentioned by the Swedish team). It therefore seems quite smart for the Swedish team to have added a page on why/how people can eat sustainable and cheaper, and the page is quite well visited. It would be interesting to know how the Swedish team makes sense of this new trend they observe.

In terms of scientific research that could provide info on the effectiveness of the economic argument, to the best of our knowledge, there is no specific research looking at the link between better meat and more expensive meat, as most studies focus on how to reduce meat consumption. As such, the issue of the meat cost is a recuring argument: research focus on how to convince people to eat less meat and to switch to plant-based alternatives stressing the price/cost issue.

Kemper et al. (2023) show that the most important reasons for meat reduction are the cost of meat, environmental concerns and meat being seen as a non-healthy option. Yet, these different elements do not differ in their ability to reduce meat consumption.

According to Carlsson et al. (2022), about a third of those who prefer meat would consider switching to a meat substitute if the price was two-thirds or less of the price of the meat option.

This tends to show that the economic argument could be relevant (the cost of meat represents a reason to consume less of it).

<u>Variables that nuance results on claims' effectiveness</u>

In a perspective that would focus on offering the most effective claim across all countries (the best fit for all), in terms of the intention to eat "less and/or better" meat, our analyses reveal a few interesting variables to take into consideration. Below are listed the covariates that appear to have an influence when all the countries are considered in the same analysis:

- **Age**: Older people tend to be more likely to change their diet (marginally significant).
- **Gender**: Women tend to be more likely to change their diet (marginally significant).
- **Education**: More educated people are more likely to adapt their diet.
- **Meat consumption frequency**: People eating less meat on a weekly basis are more likely to change their diet.

- **Environmental concern**: People scoring high on environmental concern are more likely to change their diet.
- **Health concern**: People scoring high on health concern are more likely to change their diet.
- **Price sensitivity**: People scoring high on price concern are less likely to change their diet. This result confirms the limited value of the economic claim for the WWF.
- **Masculine values, Power distance and Uncertainty avoidance orientation**[8]: People scoring high are less likely to change their diet.
- **Countries**[9]: some countries tend to differ in their likelihood to adapt their diet (Sweden > France > Estonia > Portugal > Austria). Such differences could potentially help the WWF prioritize campaigns on a global basis, considering that in some countries people may both eat more meat and be more likely to change their diet.

The 3 cultural dimensions (Masculinity; Power distance and Uncertainty avoidance) that display a direct impact do not moderate the influence of the arguments on intentions to eat less and/or better meat. In other words, and for example, it means that although being a "masculine" society may influence the extent to which people will eat less and/or better meat (and based on our results, this is a negative influence, masculine society are more reluctant to eat less and/or better meat), the relative effectiveness of the claims does not depend on masculinity.

Learning:

Women, environmentally concerned individuals, educated people and the elderly tend to be more likely to adapt their diet (marginally significant).

People eating less meat on a weekly basis, people scoring high on price sensitivity, people scoring high on masculine values, on power distance and on uncertainty avoidance are less likely to adapt their diet. Some countries tend to differ in their likelihood to adapt their diet (Sweden > France > Estonia > Portugal > Austria). Such differences could potentially help the WWF prioritize campaigns on a global basis, considering that in some countries people may both eat more meat and be more likely to adapt their diet.

[8] At the individual level, our analyses only consider 5 cultural orientations of the Hofstede' model as the long-term orientation dimension did not appear to be measured in a robust and valid way. The items used to measure cultural orientations on an individual level are displayed in Appendix 1, but we remind them here. Items to **measure masculine values** include "It is more important for men to have a professional career than it is for women", "Men usually solve problems with logical analysis; women usually solve problems with intuition", and "Solving difficult problems usually requires an active, forcible approach, which is typical of men". Items to measure **uncertainty avoidance** include "It is important to have instructions spelled out in detail so that I always know what I'm expected to do", "It is important to closely follow instructions and procedures", and "Instructions for operations are important". Items to measure **power distance** include "People in higher positions should not ask the opinions of people in lower positions too frequently", "People in higher positions should avoid social interaction with 20 people in lower positions", and "People in lower positions should not disagree with decisions by people in higher positions".

[9] It is important to remind that countries differ along Hofstede's cultural dimensions, but inside countries respondents also differ in how they perceive their own individual culture.

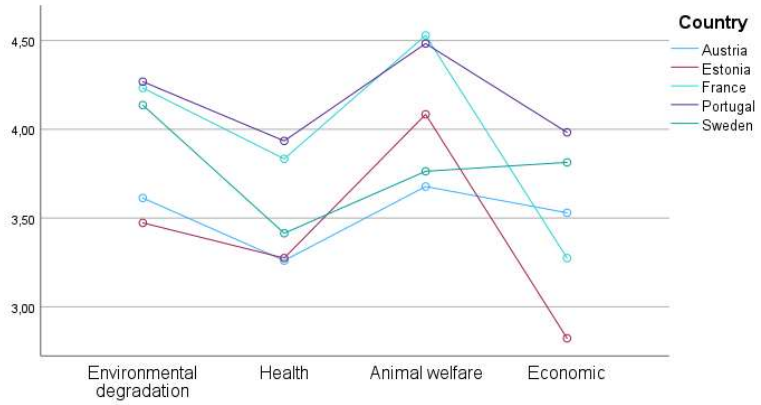
3) Results related to additional/side effects of claims

Regarding moral emotions ("emotions that are linked to the interests or welfare either of society as a whole or at least of persons other than the judge or agent", Haid, 2003), we explored the influence of anticipated guilt and pride[10]. The anticipated **guilt**[11] at the idea of not changing one's diet, and the level of guilt depends on the country and type of claims.

Methodological note:

In the previous graphs, we separately showed respondents' responses to the "intentions to eat less meat" question and their responses to "intentions to eat a better-quality meat. From this moment on in WP1&4, we now consider the aggregate response to both questions. As it is the "improvement of their meat consumption" that we seek to identify and considering that less and better meat was always presented together, we consider that "less meat" and "better-quality" meat should be considered at the same time to be representative of the changes. The follow-up experiments will test further the combination of these two claims in the stimuli.

Figure X. Effects of claims on anticipated guilt on intentions to eat better/less meat



Learnings:

As shown on the Figure, the claims about animal welfare and environmental degradation generate significantly more anticipated guilt than the claims about health or money.

[10] We only tested the influence of a limited number of variables (notably guilt and pride as moral emotions) to avoid make the questionnaire longer, so we can only provide results on that. Yet, there might indeed be other emotions or cognitions, etc. that come into play.

[11] Anticipated guilt is measured as follows: "how much guilt I anticipate experiencing if I do not change my diet after being exposed to the specific argument".

Of note

This result is interesting as **numerous scientific studies** have demonstrated **the effectiveness of guilt in changing behavior (**Chang, 2014**)**: guilt creates a moral discomfort that the individual will try to reduce by adopting the recommended behavior. Yet, it is an emotion to be used with care because it can induce totally counterproductive effects if the people exposed to guilt do not know how to deal with the guilt they experience or anticipate (i.e., a "boomerang" reaction in the opposite direction to that recommended).

In a similar vein, anticipated **pride** could have an influence on behavioral change (although studies tend to show that positive affects are less effective than negative ones when behavioral changes are considered, especially in environmental and health com (Yousef et al. 2021), and although they may vary according to targets' specificities). Yet, in our experiment, the type of claim has no influence on the anticipation of pride (no direct effect, nor interaction effect with the country). Only the country seems to influence the anticipation of pride, with Portuguese tending to anticipate more pride whatever the claim.

To be noted, our data allow to specify the influence of anticipated guilt and pride on the intention to eat "less and/or better" meat.

Learnings:

Both anticipated moral emotions (**pride and guilt**) have an influence on the intention to eat "less and/or better" meat but anticipated **guilt is three times more effective to change behaviors than anticipated pride** (confirming previous research focusing on pro-social behaviors, and although anticipated pride contributes more to happiness in a general way).

Regarding potential interaction effects, we note that – globally – the effectiveness of claims does not depend on the age of consumers, with two exceptions:

- in Austria, the health claim tends to work better for older than younger people;
- in Estonia, the environmental claim tends to work better for older than younger people;
- in France specifically, consumers' age has no direct nor indirect influence on the intention to eat "less and/or better" meat. As such, the follow-up experiments are carried in France to control for the age influence and do not specifically focus on the potential moderating influence of age.

4) <u>Additional results related to individuals' cultural orientation</u>

Based on an in-depth analyses of individuals cultural orientation on claims effectiveness, a research paper has been written and presented with the approval of WWF and credentials at the 2023 Global Marketing Conference at Seoul in July 2023. The track in which the paper was presented is dedicated to an "Appetite" (international research journal specializing in cultural, social, psychological, sensory, and physiological influences on the selection and intake of foods and drinks https://www.sciencedirect.com/journal/appetite) special issue, that appear a most relevant output to

disseminate WWF's work and our results), as required in our agreement with WWF and after their approval of our submission.

This paper, accepted for presentation to the conference, is entitled "The role of culture in the effectiveness of environmental appeals to reduce unsustainable meat consumption". It is reproduced in Appendix 3; we only display its abstract below.

> *Considering meat consumption's massive impact on climate change, environmental NGOs are increasingly campaigning to encourage consumers to reduce unsustainable meat consumption, i.e., to eat less and/or better meat. They usually use messages based on environmental appeals to do so. Yet, the effectiveness of such appeals in international campaigns may depend on countries as cultural beliefs influence food consumption behaviors. Therefore, in this research, we explore the effectiveness of such campaigns across 5 European countries, controlling for individual cultural orientations. Considering an environmental degradation appeal, we first show that countries have no influence on the campaign's effectiveness, unlike specific individual cultural orientations, including masculinity and uncertainty avoidance. We replicate these results in the same 5 countries considering an alternative appeal, i.e., animal welfare.*

Of note: A longitudinal perspective?

The scientific literature has extensively proven that repetition of an information is necessary to increase its memorization (Cacioppo & Petty, 1989) and to render it more "accessible" (people retrieve this info more easily from their memory), hence "diagnostic/reliable" (they rely on to make a decision) when comes a time to make choices (Menon et al., 1995).

"Managerial" publications also indicate how many times a promotional message should be repeated depending on the media modes (audio-visual vs. audio, vs. visual), and one last element that should also be taken into consideration is the multitasking (doing 2 or more things at the same time) that people may be active in while exposed to a message reduces attention and cognitive abilities (Garaus et al., 2017).

Yet, repetition comes with risks as this may create boredom and reactance (wear out) (Pechmann & Stewart, 1988). Furthermore, it is said that it is necessary to repeat a new behavior for this new behavior to become a habit. It cannot be said precisely how much or for how long: averages are between 3 and 9 weeks, but it took up to 254 days for some people to reach automaticity in their new behaviors, which indicates that this is extremely contextual and individual (Lally et al., 2009).

All in all, repetition is a very complex subject, but it certainly helps, as long as one does not reach wear out.

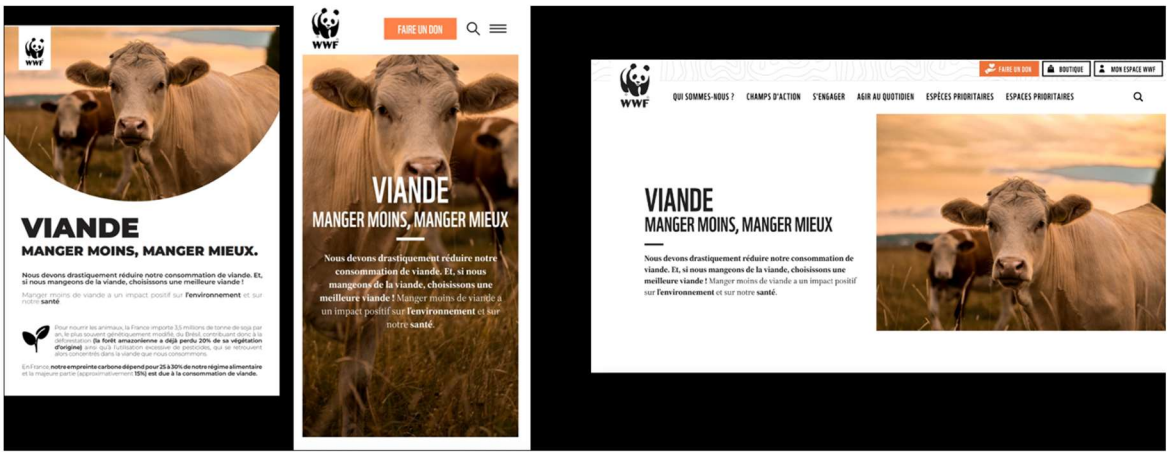
WP2: comparison of media effectiveness (leaflet, website, app)

Method

In this study, each participant is assigned to one of three communication mediums: leaflet, app, or website (cf. between subject design explained above). Each participant interacted with one and only one of the three communication mediums (Figure X).
The content of each communication presented on the various mediums and their design were carefully crafted around the arguments used by WWF and based on WP1&4 results. Each medium was designed by a graphic designer to ensure realism. They are not official WWF documents.
Of course, all mediums presented the same information content for comparison to be possible and results not to be attributed to content instead of medium.
The 3 mediums were randomly presented to the participants (which ensures group equivalence, as explained above in WP1), and equally presented.

Stimuli used in the WP2 (in French)

Leaflet App Website



As agreed, the data were collected on French students aged between 18-25, in face-to-face. The questionnaire was introduced as a survey of French consumers' eating habits with consumers eating meat (omnivore or flexitarian). Participants' informed written consent was required.

Measures:

The following measures were taken:

- **Perceived realism:** assessed through a single question to ensure that all three mediums were perceived as realistic, with responses on a 7-point Likert scale "totally disagree to totally agree".
- **Reliability of information in the mediums:** assessed through a single question, to perceive the extent to which people would rely on the information to make a decision with responses on a 7-point Likert scale "totally disagree to totally agree".
- **Guilt:** see WP1
- **Intentions to consume more vegetarian alternatives to meat:** (see stage of change, see WP1)
- **Socio-demographic questions:** including age, gender, and dietary habits (omnivore and flexitarian).

These measures aimed at comprehensively evaluate participants' reactions and perceptions regarding the information provided in the com through the different media and their intention to adapt their diet (vegetarian alternatives to meat).

Participants

We collected 151 valid questionnaires (55 exposed to a leaflet, 47 exposed to a website and 49 exposed to an App). The mean age of the respondents is 23 years, 67% were women, 30% men and 3% other; and there were 78% of omnivore and 22% of flexitarian diet.

Results

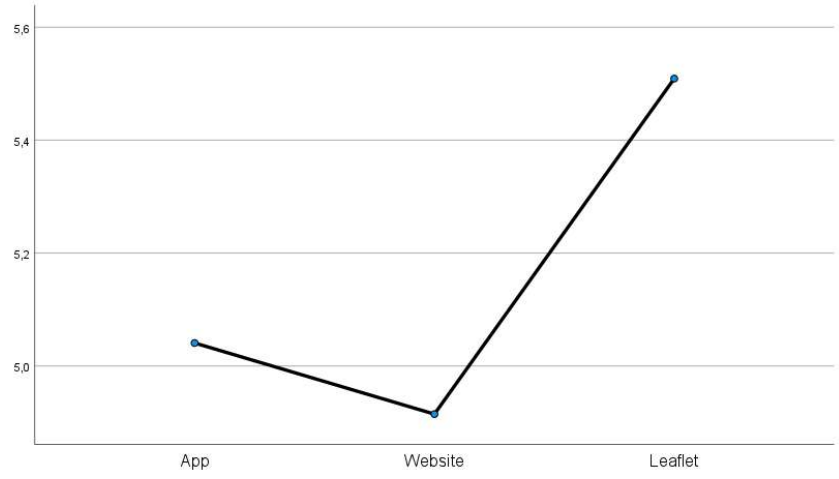
Perceived realism

We first controlled that the 3 communication mediums were considered “realistic”. Additionally, they all present the same level of realism. This enables us to compare the 3 mediums knowing that “perceived realism” cannot be considered as influencing our results.

Medium reliability

Our analyses indicate that the communication medium has an influence on its perceived reliability. In other words, the type of media changes the extent to which people will rely on the information before taking action/deciding. As such, the leaflet presents a better reliability than the website. However the leaflet is not statistically different from the App, although the trend shows that leaflet is perceived as more reliable compared to the App.

Effect of WWF communication medium on communication reliability

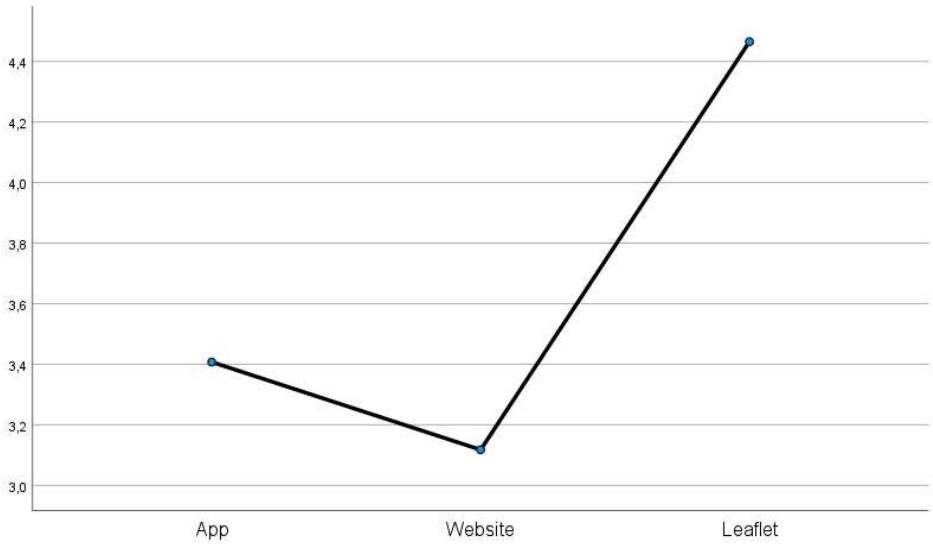


Anticipated guilt

Communication medium has an influence on guilt anticipated if one does not adapt one's diet to less meat. As such, the leaflet induces more guilt than the website. However, the leaflet has the same

influence as the App, as the differences are not significant. Yet, there is a trend towards more anticipated guilt when exposed to a leaflet vs. the App.

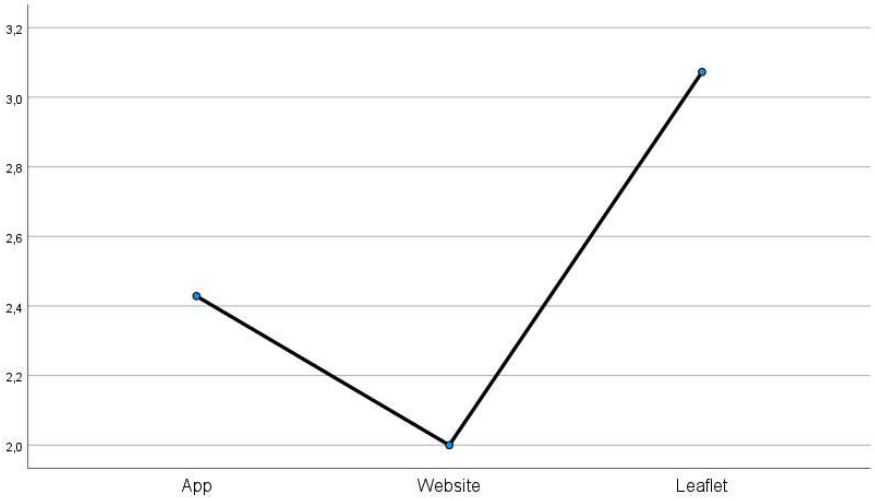
Effect of WWF communication medium on guilt



Intentions to eat more vegetarian alternatives.

Communication mediums impact intentions to eat more vegetarian alternatives. As such, the leaflet has a stronger influence than the website, however the leaflet has the same influence as the App on a vegetarian diet even if the trend shows a stronger effect of the leaflet than the App (but this is not statistically significant)

Effect of medium on intentions to eat more vegetarian alternatives.



Learnings

Our results indicate that the best communication medium, whether we consider perceived reliability of medium in decision-making, anticipated guilt and intention to

Role of guilt in mediums' influence on intentions to consume more vegetarian alternatives

We then wanted to check whether experiencing more/less guilt could be the reason why the medium producing it would influence diet changes. As the strongest differences in terms of influence of communication medium is to be found between the leaflet and the website, we only compared those 2. Results reveal that the intentions to eat more vegetarian alternatives are indeed higher because the leaflet triggers more guilt than the website. This process is presented on the graph below:

Variable that nuances results (moderating variables): participant's diet

We conducted further analysis to observe the potential influence of participants' diet on the anticipated guilt if not consuming more vegetarian alternative after exposure to one of the 3 communication mediums. In other words, we wanted to nuance our results according to participant's diets, expecting that those who are already eating less meat (flexitarian) would be less influenced by media and guilt.

It should be stressed however that our respondents' diets were not perfectly similar across all mediums (see table below that shows more omnivores than flexitarians).

Participants' diet within the communication medium group.

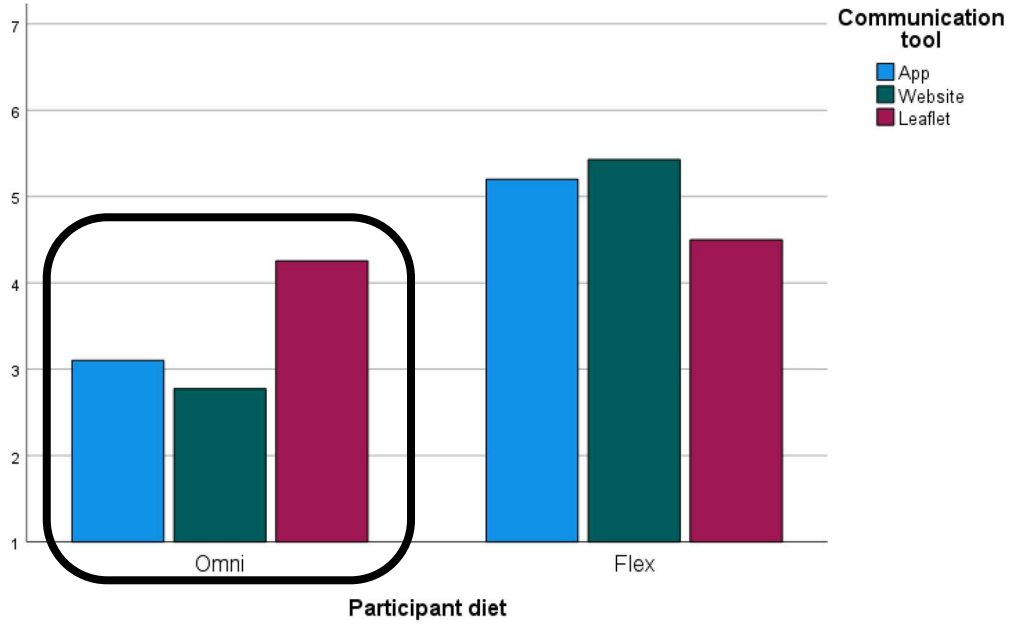
		Participant diet		
		Omni	Flex	Total
Communication Medium	App	25,8%	6,6%	32,5%
	Website	26,5%	4,6%	31,1%
	Leaflet	25,8%	10,6%	36,4%
Total		78,1%	21,9%	100,0%

Results on the anticipated guilt.

- **Among omnivores**, the **leaflet induces the highest levels of guilt** compared to the website and app. Again, there is no difference between the app and the website.

- **Among flexitarians**, there is no difference in the amount of guilt induced, whatever the medium. Yet, the levels of guilt are higher than for omnivores.
- **The levels of guilt** experienced by the respondents **is significantly higher in the flexitarian** compared to omnivores group.

Role of participant's diet on the anticipated guilt according to the communication mediums



Of note

These findings are probably explained by the level of involvement of a flexitarian in his diet. One can indeed expect that a flexitarian has deliberately or consciously reduced his/her meat consumption. Therefore, not behaving in a way that is consistent with this decision will produce more negative affect than someone who has not engaged yet in eating less meat.

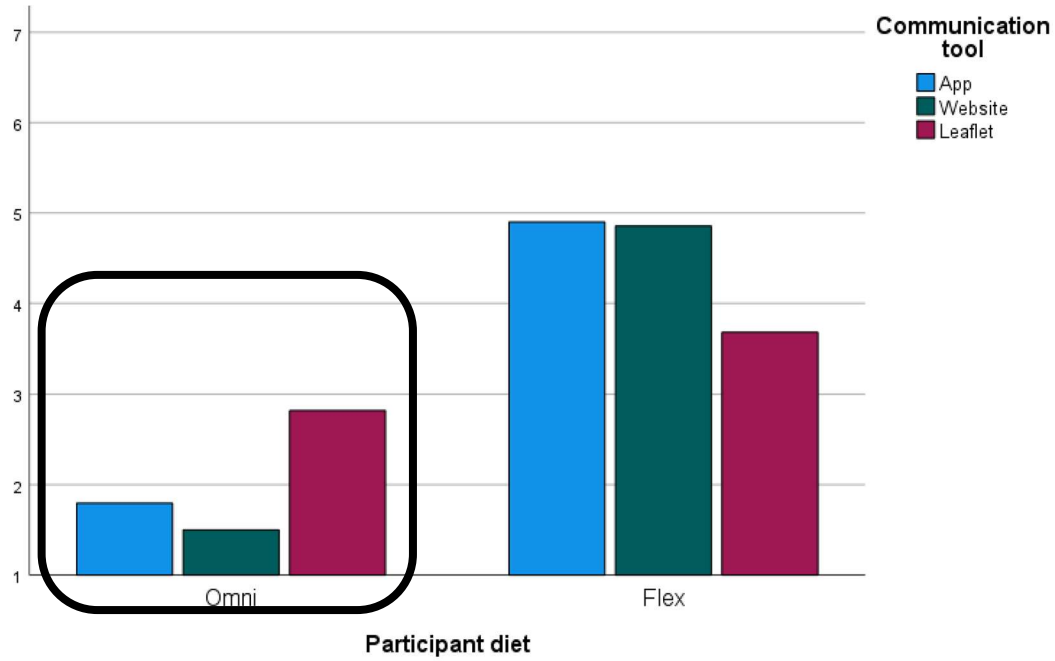
These **results** are aligned with those relative to **intentions to consume more vegetarian alternatives**.

- **Among omnivores**, the **leaflet induces the highest levels of intentions to consume more vegetarian alternatives** compared to the website and app. Again, there is no difference between the app and the website.

- **Among flexitarians**, there is no difference in **intentions to consume more vegetarian alternatives**, whatever the medium. Yet, and quite logically, **intentions to consume more vegetarian alternatives** are higher for flexitarians than for omnivores (Figure X).

- The levels of **intentions to consume more vegetarian alternatives** is **significantly highe**r in the **flexitarian** compared to omnivores group.

Participant's diet effects on intentions to eat more vegetarian alternatives according to the communication mediums exposition.



Learnings

The results highlight distinct responses depending on dietary habits. Especially, for **omnivores diet**, the **leaflet** served as a **powerful nudge**, **increasing guilt** about not reducing meat compared to the website and app. However, both website and app had similar effects, suggesting they didn't significantly sway discomfort levels.

However, flexitarians remained largely unfazed by the different communication mediums. Neither the leaflet nor the website nor the app significantly influenced the levels of guilt associated with not reducing meat consumption or their intentions to adopt a vegetarian diet. Yet, the level of guilt is higher than for omnivores. This suggests flexitarians might already possess established attitudes and motivations regarding reducing meat consumption, making them less susceptible to external influences through these mediums.

Overall, **the study highlights the potential impact of communication format on meat-related discomfort and plant-based diet intentions**, particularly for omnivores.

WP3: effectiveness of the communication in context

Method

To test the content (WWF logo, predominant image, slogan, health argument, environmental argument, pictograms, recipes) of WWF most effective communication medium in an immersive purchase environment context, virtual reality was used. Virtual environments indeed present many valuable advantages:

- Immersive, respondents live an experience as in real-life (IRL)
- Collection of many detailed insights, notably on the matters of interest in the com and their impact on choices
- No agreement necessary (restaurants, supermarkets, ect..)
- Time constraints are reduced.

Of note

Virtual environments can recreate real consumption environments and enable numerous options in terms of visual communication or product organization on shelves that provide much relevant information on consumers' decision processes. They also enable individuals to mold themselves within virtual consumption environments: they can grasp products, look at them from all angles as they would in a real-life supermarket.

As in the other WPs, we will demonstrate the effectiveness of the communication medium and content thanks to a comparison (here, with unrelated communication content and source). It should be stressed however that, in this immersive environment, effectiveness will be measured with product choices (and not intentions to change one's diet as in the other WP). Again, our objective is to strengthen our results using different methods.

Protocol

To test the expected effects (product choices) in a virtual environment, the implementation of a specific protocol, composed of complex steps is required. The are as follows:

- *Poster creation*

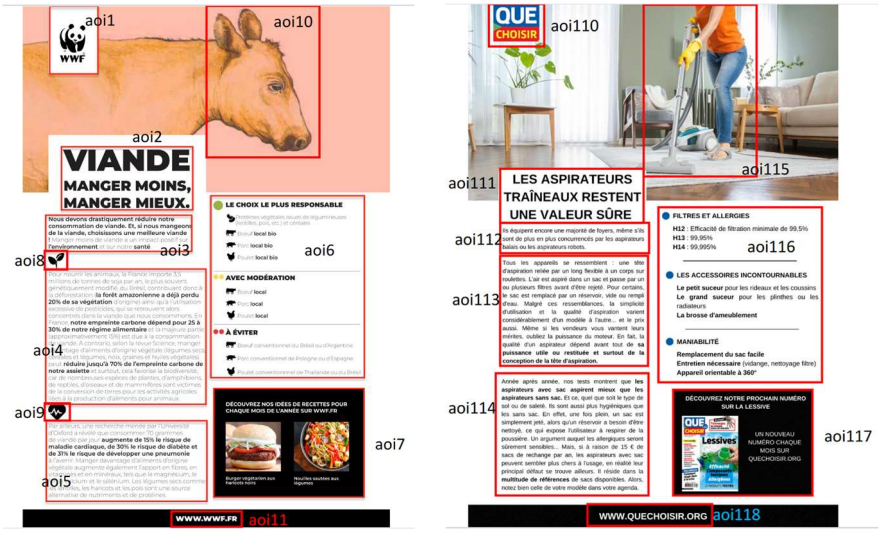
Based on WP2 results (the predominant influence of concrete mediums vs. digital ones on intentions to consume more vegetarian alternatives), and the context considered (supermarket), it was decided to test the effects of each dimension of the communication content (called "areas of interest" or AIO) with a poster. Leaflet and poster present similar characteristics (type of media for non-active info seekers), and it produces comparable levels of effectiveness (Rademaker et al., 2020). Please note however that visuals were made for the purpose of the experiment, but that they are not official WWF documents.

A professional designer created the posters used in this study, developed in French (experiment is conducted in France). WWF poster integrated all the visual elements identified as relevant to test in the previous WPs. As such, the WWF poster is divided into 11 "areas of interest" (AOI). The alternative source of communication to which the WWF (and its poster) will be compared is the UFC Que Choisir organization. UFC Que Choisir is an independent consumer association recognised for its expertise in

product testing. UFC Que Choisir specialises in defending consumer rights. It therefore benefits from a very positive attitude. The poster created (informing about a study on vacuum cleaners) is divided into 9 areas of interest (AOI). AIO will enable us to measure which (if any) of these areas impact respondents' choices.

Attitude towards posters were measured and comparison revealed no differences. Preference for one poster cannot explain our results.

Stimuli used in the WP3 (in French)



- *Virtual environment implementation*

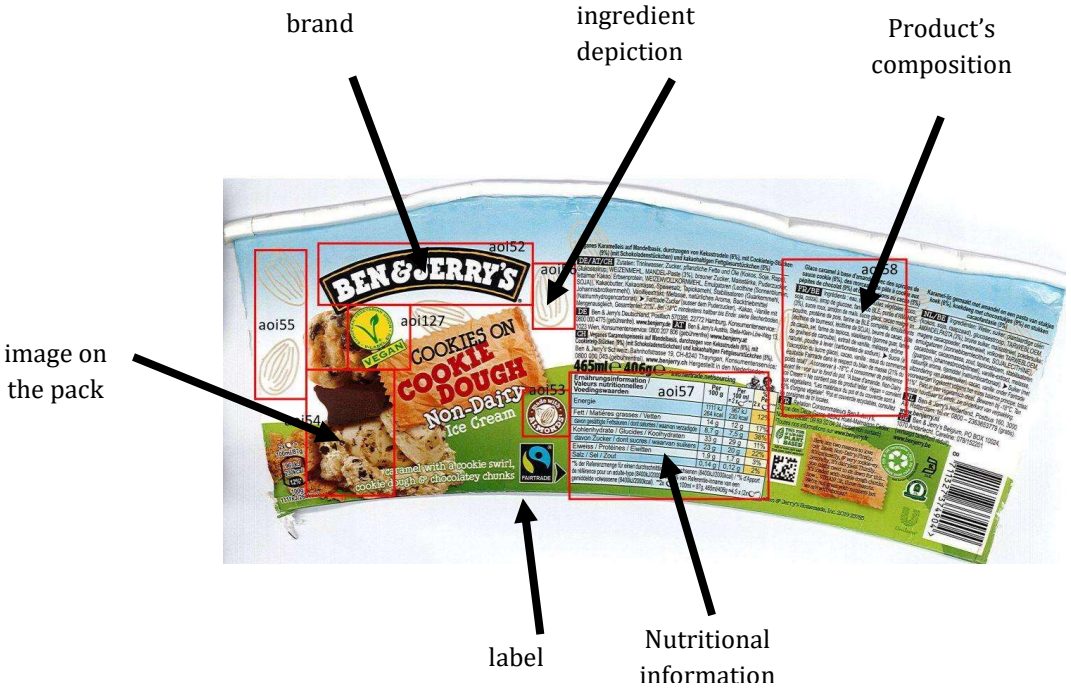
An engineering team then created a virtual supermarket environment in which we implemented different food products (that will be used to measure product choices). Those food products required careful selection to ensure that both the plant-based and animal-based versions of the same product could be found and proposed to consumers (for example, beef lasagna versus vegetarian lasagna or dairy chocolate pudding versus plant-based chocolate pudding). The idea is, for every meat-based product offered in our supermarket, a vegetarian alternative can be found.
Eventually, 12 products were identified and introduced: 6 savory (3 meat based and 3 vegetarian alternatives) and 6 sweet food products (3 animal based and 3 plant-based alternatives), to cover many potential consumer preferences).

Savory products used in the WP3

Sweet products used in the WP3

Each product contains areas of interest (AOIs, see the red frames on figure below). The time spent by consumers considering or reading the info will be measured. As participants will be asked to take the purchase in hand (as IRL), the packaging had to be scanned on all sides. Areas of interest were also identified on the packaging to enable detection of the information that was considered by participants, hence, was impacted by the poster and its content.

Example of AOI's on one product



Participants

The participants' recruitment phase was particularly complex as the study lasted 40 minutes including preparation, conducting the study, and debriefing.
The final sample consists of 137 French individuals (mean age: 28 years-old, 66% female, 66% omnivorous and 34% flexitarians). Participants are placed in an immersive and realistic product choice situation after exposure to an informational poster. Each participant is randomly exposed to one of the 2 poster (WWF or UFC poster) for 25 seconds, then, he was allowed to move around the supermarket aisles. Then, the participant was asked to choose 2 sweet products and 2 savory products, either made from animal-based proteins or vegetarian/plant-based proteins, proposed in our virtual supermarket.

Measures

The measurement indicators include:

- the time spent in front of each Area of Interest (AOI) on the display,
- the time spent on the product's AOIs,
- the number of plant-based products in the basket and the number of meat product,
- the attitude towards the organization (WWF or UFC-Que Choisir),
- the truthfulness, the credibility and the reliability of the arguments mentioned on the poster.

Results

Attitude toward the posters

Firstly, there is neither a difference in attitude between the two posters, nor one in opinion between them. Nevertheless, we found that the WWF poster is perceived as more convincing, truthful, reliable, and influencing more vegetarian choices than the UFC Que Choisir poster.

Regarding the WWF poster specifically, the environmental argument messages appear to be more truthful, credible, and reliable compared to the health argument.

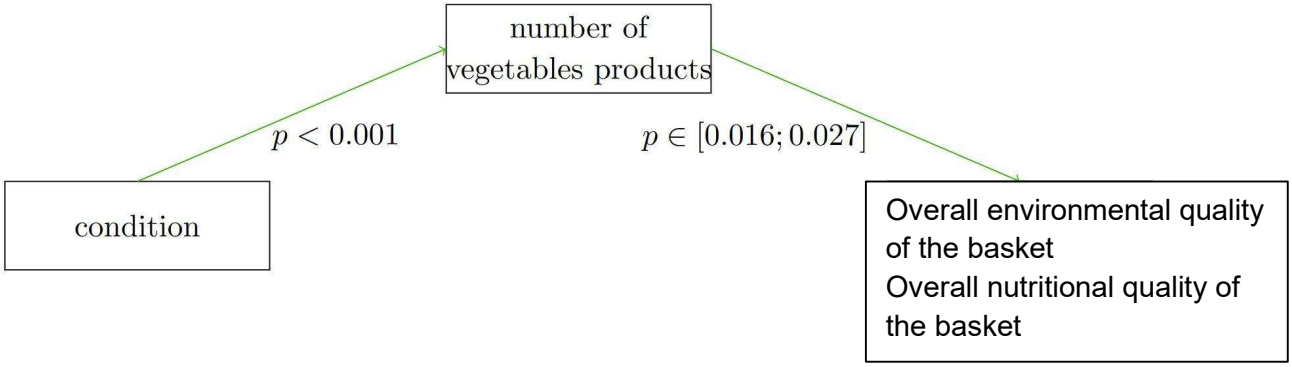
An especially interesting element is that **AOI 2 (slogan "Meat, eat less, eat better") makes the poster less convincing**. This has numerous consequences: AOI 2 has a negative impact on the quantity of plant-based proteins consumed via ingredient depiction.

Main result: Impact of the poster on plant-based product selection in supermarket

The number of plant-based products consumed is higher in the case of the WWF poster (m = 2,59) than in the case of the UFC Que Choisir (m = 2,07) poster.

Proportions of vegetarian/vegan options selected according to poster type

When exposed to the WWF poster, more plant-based products are chosen, which increases the environmental quality (eco-score) and nutritional quality (nutri-score) of the basket. The overall environmental and overall nutritional quality were evaluated thanks to the Openfoodfacts database for eco-scores and nutri-scores.

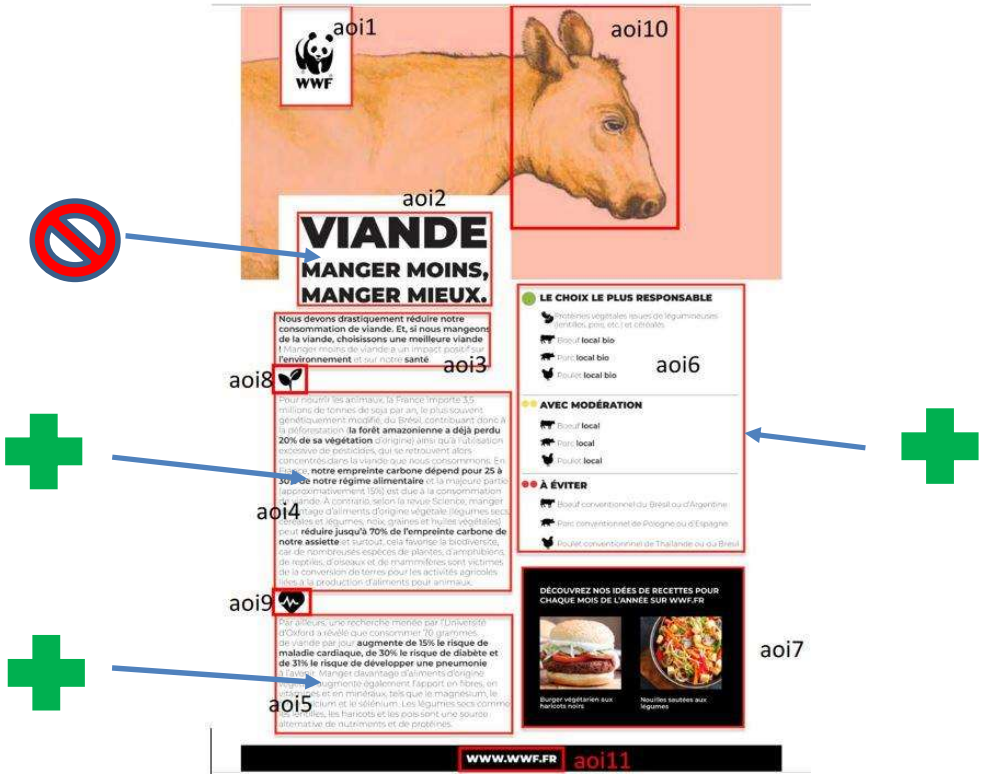


The impact of Areas of Interest (AOIs) of the poster
- on the elements observed on the products
- on the number of plant-based products chosen.

AOI 2 (slogan “Meat, Eat less, Eat better”) has a negative impact on the ingredient depiction and consequently a negative impact on the quantity of plant-based products consumed.

AOI 5 (health argument) and AOI 4 (environmental argument) have a positive impact on the ingredient depiction, thus resulting in a positive effect on the number of plant-based products chosen.

AOIs 4 (environment), 5 (health), and 6 (traffic light pictograms) have a positive impact on the images viewed on the packaging, which in turn have a positive influence on the choice of plant-based products.
Spending more time on AOI 2 makes the poster less convincing and leads to consuming fewer plant-based products. The term 'viande' (meat) must have a significant impact on consumers who emphasize the term rather than focusing on the two sentences in the subtitles.



Learning :
WWF's communication is impactful at 2 levels :(1) credibility (2) impact of its communication elements (arguments) when considering influences on behaviors in a virtual supermarket setting. Health and environmental arguments, as well as traffic lights, play a very important role in the choice of vegetarian products through consumers' focus on ingredients and on product images.
Yet, the slogan "VIANDE manger moins, manger mieux (MEAT, eat less, eat better)" appears counterproductive as it lowers selection of vegetarian products. It is likely that the prominence of the word "meat," somewhat triggers meat representations that cue meat consumption.

WP6: Additional insights on framing

Some interesting observations, relative to framing features used in the WWF meat guides, emerged from WP0. They include the type of representations of the animal, the use of traffic light, humor, figures in the claim, or recipes in the guides. Please note however that visuals were made for the purpose of the experiment, but that they are not official WWF documents.

We decided to test them through extra experiments. Those were carried in France, notably because French people do not present differences in terms of age observed in other countries, absence that limits the risks of biases.

Last, digging into additional elements to the main object of this research, it was important to make sure we could optimize time, facilitate coordination and limit costs.

In these experiments, based on the WP1 results, we used the environmental and the health arguments combined, as follows:

Method:

These new experiments were inspired by WP0, which consisted in an analysis of how the WWF different teams are communicating about the issue of meat consumption (see WP0 for more details).

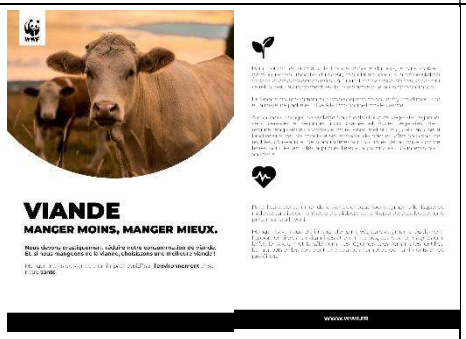
Concretely, to test all elements combined, this would mean testing 96 (2 x 3 x 2 x 2 x 2 x 2) new leaflets, a too heavy protocol, hence to costly (time, technical constraints, budget) to test all combinations. A selection had to be made. The table below shows which combinations were tested in this additional and last study.

a. Effects of types of representations of the animal

Visuals	None of the other elements in next columns = baseline	Steak	Traffic light	Figures	Humor	Recipes
Pictogram (drawing)	x	x	x	x	x	x
Cow in meadow (picture)	x	x				
Cow in stable (picture)	x	x				

The experiment adopts a 3x2 between-subjects design:

- *3 types of representations of the lively animal*: animal in pictogram vs. animal in the meadow vs. animal in battery
- *Presence vs. absence of the animal as a food product (i.e., as a steak)*

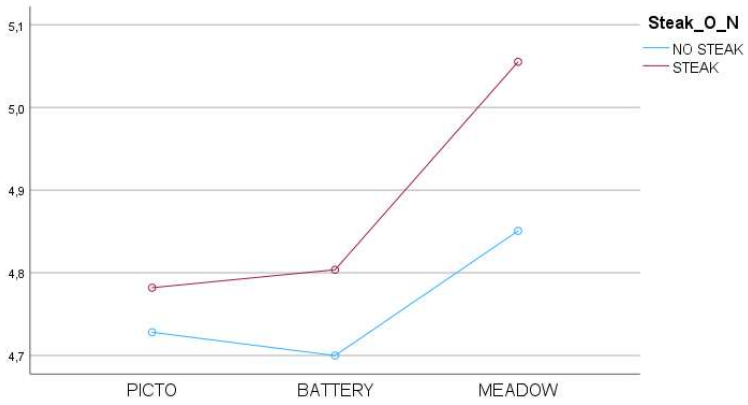
	Without a steak	**With a steak**
Animal in pictogram		
Animal in the meadow		

Animal in battery		

Respondents

For this experiment, we recruited 60 respondents per leaflet (experimental conditions) (total = 360) and ended up with 278 after deletion of respondents that did not validate the attention and manipulation checks (ensure that respondents saw the specific element differentiating each leaflet, i.e. animal representations and steak), which remains above the 30 respondents required per experimental condition (here, between 38 and 55 respondents per group; 38 years-old, 52% female, 80% omnivorous and 20% flexitarian).

Effects on the intention to eat less or better meat

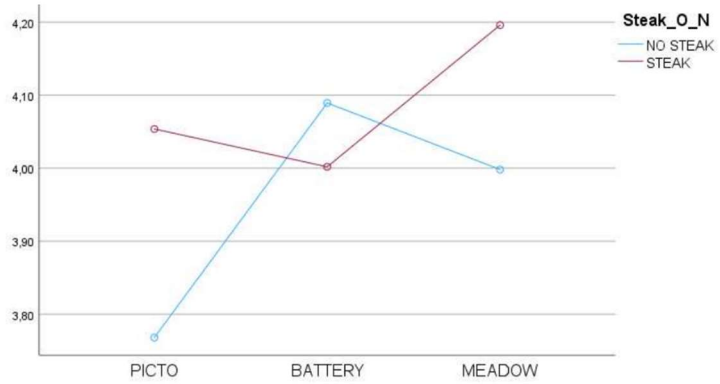


Although the differences are only marginally significant at best (10% of making an error when identifying differences among group instead of the 5% generally accepted in scientific research), it appears that the best combination to promote intentions to eat less and/or better meat includes the picture of a cow in a meadow and a steak.

Of note
Literature suggests that people don't think of the animal when they see a steak, which creates a "psychological distance" that explains that animal welfare is not that effective when comes the moment to choose, buy and eat meat (Lamy et al., 2022).

As can be seen below, it is also this combination (picture of a cow in a meadow and a steak) that triggers the highest level of anticipated guilt.

Effects on anticipated guilt



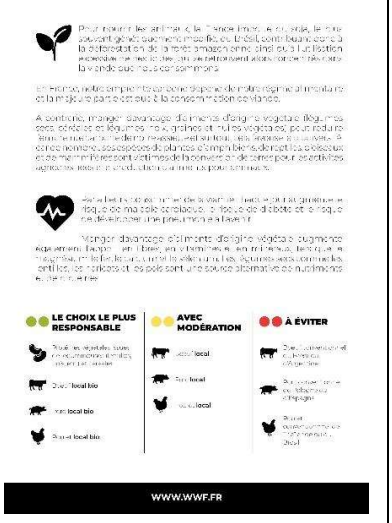
Learning:

Although the differences are only marginally significant at best, it seems that the best combination to highlight to promote intentions to eat less and/or better meat includes the picture of a cow in a meadow and a steak. It is also the combination that results in the highest level of anticipated guilt.

b. <u>Effect of traffic lights and figures</u>

To test the effect of humor in communication, the experiment adopts a between-subjects design that compares 3 leaflets:

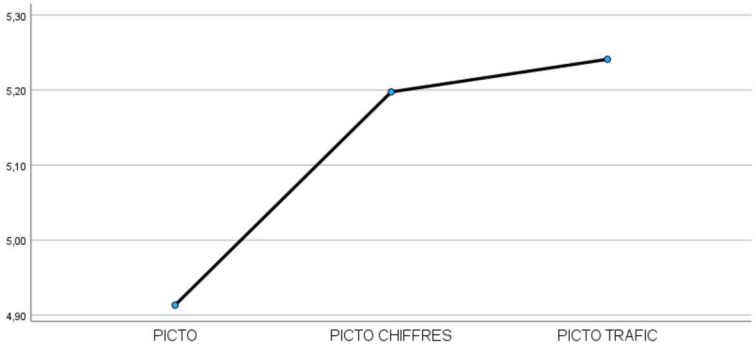
- a leaflet with a simple pictogram ("control": base against which the other leaflets will be compared);
- a leaflet that presents exactly the same information as the control one but uses a large number of figures;
- a leaflet that presents exactly the same information as the control but adds a traffic light.

Control	With figures	With a traffic light
		

Participants

For this experiment, we aimed at interrogating at least 60 respondents per experimental conditions (total = 180) and ended up with 145 after the attention and manipulation checks (between 46 and 51 respondents per leaflet, 38 years-old, 52% female, 82% omnivorous and 18% flexitarian).

Effects on the intention to eat less or better meat



The influence of the leaflet is not statistically significant, but Figure below suggests that the addition of figures in the claims or the addition of a traffic light tends to increase the intention to eat less and/or better meat.

Learning:

Although differences are not significant, the addition of figures in the claims or the addition of a traffic light tend to increase the intention to eat less and/or better meat. As already mentioned, the perceived credibility is overwhelmingly driven by respondents' attitudes towards WWF, which cancels out the influence of other antecedents (including the type of flyer). This argues in favor of the use of figures and traffic light, particularly in contexts where there is little familiarity with WWF and its commitments.

To interpret such an absence of statistical significance, we can observe that the perceived credibility of the claim does not depend on the manipulation in our data. Whatever the communication elements, perceived credibility of the com is not impacted, hence is the same across all types of com. The perceived credibility is overwhelmingly driven by respondents' attitudes towards WWF, which cancels out the influence of other antecedents (including the type of leaflet). This attitude towards the WWF affects the credibility of the arguments given, but in the same way whatever the arguments. Nevertheless, the arguments that are in fact perceived as credible can have different impacts. This argues in favor of the use of figures and traffic lights, particularly in contexts where there is little familiarity with WWF and its commitment.

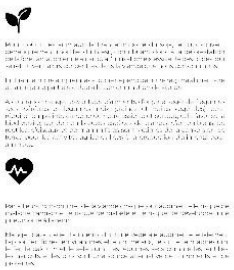
Learning:

As stated earlier, all claims proposed by WWF are considered credible by respondents, because the perceived credibility of claims first results from the attitude towards the WWF, which is high.

c. Effect of humor.

The experiment adopts a research design that compares 2 leaflets:

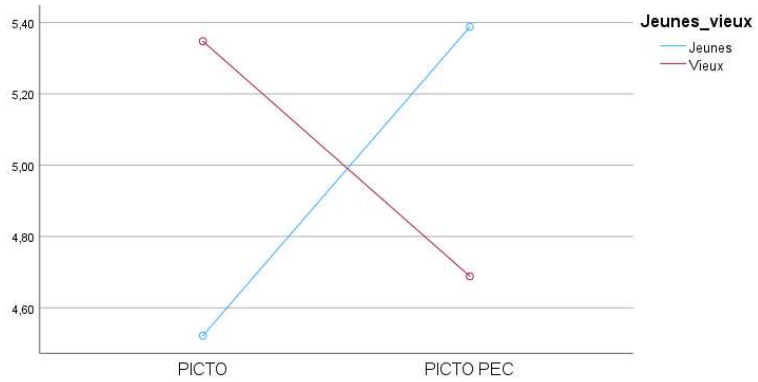
- a leaflet without humor (control);
- a leaflet that presents exactly the same information (control) but uses humor.

Control	With humor
 	 

Respondents

For this experiment, we aimed at interrogating at least 60 respondents per leaflet (total = 120) and ended up with 89 after the attention and manipulation checks (48 respondents for the first leaflet and 41 respondents for the second, 38 years-old, 48% female,79% omnivorous and 21% flexitarians).

Effects on the intention to eat less or better meat



The analyses show a significant interaction effect between age and use of humor on the intention to eat less or better meat, meaning that depending on age, humor increases the influence of the com on intention to eat less and better meat (the younger the more effective).

Learnings

Humor increases intentions to eat less and/or better meat in younger targets BUT is counterproductive on older (>40) targets.

d. <u>Effect of adding recipes</u>

The experiment adopts a unifactorial between-subjects design that compares 2 leaflets:

- a leaflet without recipe;
- a leaflet that presents exactly the same information (control) but adds recipes at the bottom.

Control	With recipes
	

Respondents

For this experiment, we ended up with 95 respondents after the attention and manipulation checks (48 respondents for the control and 47 respondents with the recipes; 38 years-old, 47% female, 73% omnivorous and 27% flexitarians).

The analyses do not show any effect of the addition of recipes on the intention to eat less or better meat. Interestingly however, it tends to increase self-efficacy[12]. In other words, it means that respondents feel more capable of changing their diet with recipes provided (even if we know it can be difficult for some to eat less meat because they fear not having a balanced diet without meat or not being able to prepare a meal without meat). This effect is not significant, it is a trend, because self-efficacy is in the first place driven by meat consumption frequency (i.e., the more frequently I eat meat, the less I feel able to change my diet).

Learning:

The analyses do not show any effect of the addition of recipes on the intention to eat less or better meat. Interestingly, it tends to increase self-efficacy (i.e., the belief that one can change one's diet. This effect is not significant, it is just "a tendance to", because self-efficacy is in the first place driven by meat consumption frequency (i.e., the more frequently I eat meat, the less I feel able to adapt my diet).

[12] Self-efficacy refers to the respondents' perception that they are capable of taking action, that their actions will be effective. We measure it as follows: "*Will it be difficult for you to adapt your eating habits when it comes to meat? ... the next time you feel depressed, bored or tense / ... the next time there's meat at a party or on the menu in a restaurant / ... the next time you have dinner with friends or work colleagues / ... the next time you feel too tired to prepare a meal / ... the next time you're cooking dinner for guests at home*" (from not at all difficult to extremely difficult). It has to be noted that the higher the score, the lower the respondents' self-efficacy beliefs.

CONCLUSIONS

Below, we summarize the main conclusions of this one-year research project, bringing together the expertise of researchers in sustainable consumer food behavior, the specialisms of our universities (e.g. Userlab for virtual reality and eye-tracking at the University of Angers) and the combine use of methodologies such as documentary studies, studies with self-reported measurements, behavioral measurements (choices in a virtual shop) and implicit/attention measurements (measurements with eye-tracking). This mixed approach strengthens the validity of our results, offering a realistic environment of exposure to informational messages and the consumption context (product choice), all elements that underpin our recommendations.

Consumer Response:

- Consumers are generally receptive to the guide, with combined health and environmental claims proving most effective.
- The guide effectively changes behavior, leading to increased selection of vegetarian options (25% higher with WWF communication).
- Supermarkets appear to be a relevant context for presenting the guide.

Claim Effectiveness:

- The effectiveness of claims varies by country, with exceptions like Austria where intentions are unaffected by claim type.
- Health claims are most effective in France, Portugal, and Austria.
- Environmental claims are most effective in Estonia and Sweden.
- Animal welfare claims show different impact according to countries.
- Economic claims are least effective overall.
- Cultural values like high masculinity, power distance, and uncertainty avoidance hinder dietary change.
- Sweden shows the highest potential for dietary change, followed by France, Estonia, Portugal, and Austria.

Communication channels:

- Leaflets are the most effective communication medium in terms of behavioral changes.
- Leaflets reach people beyond those actively seeking information.

Recommendations:

- **Prioritize combining health and environmental claims in communication.**

Considering that the environmental argument is unavoidable for the WWF, the health argument will reinforce its effectiveness because it adds an individual dimension, which currently remains the major lever for any behavior change. Furthermore, the cultural dimension, which has a significant impact on the effectiveness of a claim, supports the strategy of combining claims.

- **Consider wisely each country's specificities.**
- **Focus campaigns on countries with higher potential for dietary change.**
- **Use leaflets for effective message delivery, especially in supermarkets**.

APPENDIX 1. Questionnaire used in WP1 / WP4

Hello,

You have agreed to participate in a survey as part of a European research project. This project is about your eating behavior. We thank you for your valuable collaboration!

There are no right or wrong answers, please answer as spontaneously as possible. In accordance with the RGPD (General Data Protection Regulation), your answers are collected and will be processed anonymously.

_____

Before we go any further, of the different types of diets suggested below, which best describes yours?

o Omnivore: you eat everything without limit of frequency (1)

o Flexitarian: you eat meat or fish only occasionally (2)

o Pescetarian: you eat fish but not meat (3)

o Vegetarian: you eat neither meat nor fish (4)

o Vegan: you do not eat any animal products (meat, fish, eggs, dairy products) (5)

Go to: End of survey If Pescetarian, Vegetarian or Vegan…

When you buy a food product, what are the three most important criteria for you?

- ▢ The price (1)
- ▢ The brand (2)
- ▢ The taste (3)
- ▢ Nutritional qualities (= health) (4)
- ▢ Certification (e.g. organic) (5)
- ▢ The origin, the proximity of the production (6)
- ▢ The composition of the product (number and quality of ingredients) (7)
- ▢ The respect of the environment (8)
- ▢ Respect for animal welfare (9)
- ▢ Respect for farmers (= fair trade) (10)
- ▢ Novelty, innovation (11)
- ▢ The ease of preparation (12)

_____

How many times a week do you eat meat?

0 2 4 6 8 11 13 15 17 19 21

(in number of meals)	

Our research is in two parts.

On the next page, we invite you to read an informational brochure on food provided by the World Wide Fund for Nature (WWF).

In the second stage, we will ask you to answer questions about the information brochure.

Please read the WWF brochure very carefully as it will appear on the next page.

RANDOM Block ENV

Please take the time to read the WWF information brochure below.

The NEXT button will not appear for another 20 seconds.

BROCHURE

Page break

The next questions can be found after the information brochure which we remind you here:

BROCHURE

Given the information provided by WWF, please click on the answer that best describes your position:

o I do not plan to adapt my diet to eat **better quality meat** (1)

o I plan to adapt my diet to eat **better quality meat** (2)

o I plan to start adapting my diet to eat **better quality meat** in the future (3)

o I have begun to adapt my diet to eat **better quality meat** in the past 6 months (4)

o I adapted my diet to eat **better quality meat** more than 6 months ago (5)

Given the information provided by WWF, please click on the answer that best describes your position:

o I do not plan to adapt my diet to eat **less meat** (1)

o I plan to adapt my diet to eat **less meat** (2)

o I plan to start adapting my diet to eat **less meat** in the future (3)

o I have begun to adapt my diet to eat **less meat** in the past 6 months (4)

o I adapted my diet to eat **less meat** more than 6 months ago (5)

Given the information provided by WWF, please click on the answer that best describes your position on plant-based alternatives to meat (lentils, peas, beans, soy, etc.):

o I do not intend to adapt my diet to consume **more plant-based alternatives to meat** (1)

o I plan to adapt my diet to eat **more plant-based alternatives to meat** (2)

o I plan to start adapting my diet to eat **more plant-based alternatives to meat** in the future (3)

o I have started to adapt my diet to eat **more plant-based alternatives to meat** in the past 6 months (4)

o I adapted my diet to eat **more plant-based alternatives to meat** more than 6 months ago (5)

Page break

The next questions can be found after the information brochure which we remind you here:

BROCHURE

Given the information provided by WWF, how do you feel or would you feel about not trying to adjust your diet to eat **less meat**?

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
I would feel guilty (1)	o	o	o	o	o	o	o
I would feel uncomfortable (2)	o	o	o	o	o	o	o
I would feel bad (3)	o	o	o	o	o	o	o
I would feel sorry (4)	o	o	o	o	o	o	o
I would feel ashamed (5)	o	o	o	o	o	o	o

Given the information provided by WWF, how do you feel or would you feel about not trying to adjust your diet to eat **better quality meat**?

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
I would feel guilty (1)	o	o	o	o	o	o	o
I would feel uncomfortable (2)	o	o	o	o	o	o	o
I would feel bad (3)	o	o	o	o	o	o	o
I would feel sorry (4)	o	o	o	o	o	o	o
I would feel ashamed (5)	o	o	o	o	o	o	o

Page break

Given the information provided by WWF, how do you feel or would you feel about adjusting your diet to eat **more plant-based alternatives to meat**?

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)

I would feel proud (1)	o	o	o	o	o	o	o
I would feel satisfied with myself (2)	o	o	o	o	o	o	o
I would feel accomplished (3)	o	o	o	o	o	o	o
Click on "strongly agree" (4)	o	o	o	o	o	o	o
I would feel worthy (5)	o	o	o	o	o	o	o
I would feel confident (6)	o	o	o	o	o	o	o

How difficult will it be for you to adjust your eating habits when it comes to meat?

	Not at all difficult (1)	(2)	(3)	Neither easy, nor difficult (4)	(5)	(6)	Extremely difficult (7)
... The next time you feel depressed, bored or tense (1)	o	o	o	o	o	o	o

... The next time there is meat at a party or on a restaurant menu (2)	o	o	o	o	o	o	o
... The next time you have dinner with friends or co-workers (3)	o	o	o	o	o	o	o
... The next time you feel too tired to prepare a meal (4)	o	o	o	o	o	o	o
... The next time you are making dinner for guests at home (5)	o	o	o	o	o	o	o

RANDOM Block HEALTH

RANDOM Block ANIMAL

RANDOM Block ECONOMIC

Block Attitudes

When I choose food products

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
I think a lot about my health (1)	o	o	o	o	o	o	o
I pay attention to my health (2)	o	o	o	o	o	o	o
I am constantly concerned about my health (3)	o	o	o	o	o	o	o
I spend time looking for the lowest prices (4)	o	o	o	o	o	o	o
I make an effort to find the cheapest products (5)	o	o	o	o	o	o	o
I always try to find the cheapest products (6)	o	o	o	o	o	o	o

Page break

It is important to me that the foods I consume in a normal day...

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
... are prepared with respect for the environment (1)	o	o	o	o	o	o	o
... are produced without disturbing the balance of nature (2)	o	o	o	o	o	o	o
... are packaged with respect for the environment (3)	o	o	o	o	o	o	o
... are produced without animal suffering (4)	o	o	o	o	o	o	o
... are produced with respect for animal rights (5)	o	o	o	o	o	o	o

Page break

Would you say that eating meat...

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
... is a custom in your family (1)	o	o	o	o	o	o	o
... is a culinary tradition in your country (2)	o	o	o	o	o	o	o
... contributes to socialization and conviviality (3)	o	o	o	o	o	o	o
Click on "strongly agree" (4)	o	o	o	o	o	o	o

Block “cultural orientations”

Would you say:

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)

It is more important for men to have a professional career than for women (1)	o	o	o	o	o	o	o
Men generally solve problems through logical analysis, women through intuition (2)	o	o	o	o	o	o	o
Solving difficult problems usually requires an active and energetic approach, which is typical of men (3)	o	o	o	o	o	o	o
Individuals must sacrifice self-interest for the benefit of the group (4)	o	o	o	o	o	o	o

Group welfare is more important than individual rewards (5)	o	o	o	o	o	o	o
Group success is more important than individual success (6)	o	o	o	o	o	o	o

Page break

Would you say:

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
People in higher positions should not ask for advice too often from people in lower positions (1)	o	o	o	o	o	o	o

People in higher positions should avoid social interaction with people in lower positions (2)	o	o	o	o	o	o	o
People in lower positions should not disagree with decisions made by people in higher positions (3)	o	o	o	o	o	o	o
Individuals must give up today's pleasure to succeed in the future (4)	o	o	o	o	o	o	o
The long term is more important than the short term (5)	o	o	o	o	o	o	o
Personal consistency and stability are important (6)	o	o	o	o	o	o	o

Page break

Would you say:

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
I like it when I know exactly what is expected of me (1)	o	o	o	o	o	o	o
It's important to follow the rules exactly (2)	o	o	o	o	o	o	o
I don't like it when things change (3)	o	o	o	o	o	o	o
In my private life, it is important to keep some free time for fun (4)	o	o	o	o	o	o	o
There should be no limits to the joy of life of individuals (5)	o	o	o	o	o	o	o

The satisfaction of desires should not be delayed (6)	o	o	o	o	o	o	o

Would you say:

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
We should not buy foreign products, because it hurts our economy	o	o	o	o	o	o	o
Only products that are unavailable in [country] should be imported	o	o	o	o	o	o	o
Purchasing foreign products allows other countries to get rich off of us	o	o	o	o	o	o	o

Blok WWF

Prior to this study, had you ever heard of WWF?

o Yes (1)

o I am not sure (2)

o No (3)

Show this question : If Before this study, had you ever heard of the WWF? (NOT NO)

Which animal is represented on the WWF logo?

o A polar bear (1)

o A panda (2)

o An owl (3)

o I don't know (4)

Show this question : If Before this study, had you ever heard of the WWF? (NOT NO)

Would you say

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
I don't like WWF at all	o	o	o	o	o	o	o	I like WWF very much
My opinion of WWF is negative	o	o	o	o	o	o	o	My opinion of WWF is positive

Page break

In my opinion, the information conveyed in the WWF brochure is :

	Do not agree at all (1)	(2)	(3)	Neither agree, nor disagree (4)	(5)	(6)	Totally agree (7)
truthful (1)	o	o	o	o	o	o	o
credible (2)	o	o	o	o	o	o	o

reliable (3)	o	o	o	o	o	o	o

What argument did the WWF information brochure you were exposed to put forward to encourage you to adapt your meat consumption?

o The environment (1)

o Money (2)

o Health (3)

o Animal welfare (4)

o I don't remember (5)

Do you find the WWF brochure realistic?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all realistic	o	o	o	o	o	o	o	Extremely realistic

Blok Sociodemographics

What is ▼ 2005 (1) ... 1950 (56)

How would you describe your sexual identity?

o Male (1)

o Female (2)

o Non-binary (3)

o Some other way (4)

o I prefer not to say (5)

What was your last diploma? (ADAPTED BY EACH COUNTRY)

What is the composition of your household?

o Single adult without children (1)

o Single adult with children (2)

o Couple without children (3)

o Couple with children (4)

o Other composition without children (5)

o Other composition with children (6)

Page break

The brochure presented to you was created for research purposes only. It does not contain WWF's full recommendations on meat consumption. The actual meat guide, which focuses on the environmental impact of meat, is available at: https://www.wwf.fr/agir-au-quotidien/alimentation/viande.

(PLEASE PROVIDE THE APPROPRIATE LINK FOR YOUR COUNTRY)

APPENDIX 2. Meat consumption by diploma

Below (1) how diploma was coded (differences may occur from one country to the next due to translation and national relevance), (2) the frequency of meat consumption by “category of diploma” (per week), and the number of respondents in each “category of diploma”.

Austria

Was ist Ihre höchste abgeschlossene Ausbildung?

- ○ Kein Pflichtschulabschluss
- ○ Pflichtschule
- ○ Lehrabschluss
- ○ Berufsbildende mittlere Schule ohne Matura (z.B. Handelsschule, 3 jährige HBLA)
- ○ Allgemeinbildende oder berufsbildende höhere Schule mit Matura (z.B. Gymnasium, HTL, HAK)
- ○ Universität / Fachhochschule

Diplome	Moyenne	N	Ecart type
2	5,5000	10	3,20590
3	5,4242	33	3,83267
4	4,4615	13	2,56955
5	4,6429	42	3,05894
6	8,3902	82	5,68028
Total	6,5278	180	4,83173

a. Country = Austria

Estonia

Milline on teie haridustase?

- ○ põhiharidus, kutseharidus põhihariduse baasil
- ○ keskharidus, kutsekeskharidus
- ○ bakalaureusekraad
- ○ Magistrikraad, doktorikraad

Diplome	Moyenne	N	Ecart type
1	4,4000	5	1,51658
2	6,5893	56	4,19427
3	7,3696	46	4,96816
4	8,6316	19	4,77506
Total	7,0952	126	4,55794

a. Country = Estonia

France

Quel est votre dernier diplôme obtenu ?

- ○ Brevet / BEP / CAP
- ○ BAC
- ○ BTS / DUT / Licence
- ○ Master et plus

Diplome	Moyenne	N	Ecart type
1	6,4815	27	3,64133
2	5,9388	49	3,73836
3	6,0745	94	3,47414
4	5,8750	72	3,10355
Total	6,0331	242	3,42661

a. Country = France

Portugal

Qual foi o seu último diploma?

- ○ 9º ano (nível 2)/Ensino secundário (nível 3)
- ○ Ensino secundário obtido por percursos de dupla certificação/Ensino secundário vocacionado para prosseguimento de estudos de nível superior acrescido de estágio profissional – mínimo de seis meses (nível 4)
- ○ Curso de Especialização Tecnológica (CET) (nível 5)/Licenciatura (nível 6)
- ○ Mestrado e mais (níveis 7 e 8)

Diplome	Moyenne	N	Ecart type
1	5,8000	20	2,91277
2	6,8837	43	3,11837
3	6,5270	74	4,31062
4	7,0889	45	3,42333
Total	6,6703	182	3,69277

a. Country = Portugal

Sweden

Vilken är din utbildningsnivå?

- ○ Högstadieexamen
- ○ Gymnasieexamen
- ○ Yrkeshögskola
- ○ Kandidatexamen
- ○ Masterexamen eller mer

Diplome	Moyenne	N	Ecart type
1	6,1818	11	4,89527
2	6,9167	60	4,23581
3	6,9524	21	3,98091
4	5,9500	40	3,78221
5	7,1304	23	4,90180
Total	6,6516	155	4,21437

a. Country = Sweden

APPENDIX 3. Literature on moral emotions

Using negative emotions (among which guilt, fear, disgust) is very frequently and, often, very effectively used in campaigns that aim at changing behaviors. Specifically, guilt is a moral emotion that creates an uncomfortable emotional state from which individuals wish to free themselves. As long as the communication offers a “plausible/feasible” solution (behavior to adopt to reduce this guilt), individuals will tend to adopt the advice proposed in the communication -> the communication reaches its goal. Compared to pride, it is much stronger in changing behaviors., However, there are important points to consider when using negative feelings, and specifically guilt

1. Guilt is particularly effective when the solution proposed emphasizes the egoistic benefits of the audience (more than those of the receiver) : for instance, a message that emphasize how a donation makes the donator a generous person is more effective than how a donation saves a children (Chang, 2014). In our case, although animal welfare creates guilt, the solution would be to reduce meat consumption which, for many, reduces their egoistic benefits. Furthermore, one of the problems that research points out as a reason why animal welfare is not an effective argument is that there is a psychological distance between the animal and the piece of meat people bought at the supermarket/butcher. Although you may create guilt when people see the communication, this may not be activated at the time of purchase/consumption (Graves & Roelich, 2020; Lamy et al., 2022).
2. Using guilt does not go without risk, particularly for the organization’s image, and due to the negative ethical perception that falls on an organization when, through its communication, it induces stress or reduces the well-being of its audiences. Idealistic or deontological perspective of ethics do not integrate the positive consequences or circumstances in the ethical evaluation but rather whether this is a acceptable thing to do (induce guilt). In other words, whatever the positive implications, the ethics of the practice is questioned - it is simply perceived as “not the right thing to do" and this can fall back on the organization.

APPENDIX 4. The role of culture in the effectiveness of environmental appeals to reduce unsustainable meat consumption

Introduction and Research Aim

There is a consensus that our food choices contribute to climate change (IPCC, 2019) and that its impact differs according to the type of food considered (Visschers & Siegrist, 2015). Among those, meat would be the most impactful, specifically compared to a vegetable-based diet (Leip et al., 2015). Efforts to encourage a reduction in unsustainable meat consumption (that is, consuming less meat or more sustainable meat) are therefore at the heart of environmental campaigners' actions, notably through communication. Quite logically, the environmental argument is then the most frequently used (Palomo-Vélez et al., 2018). One could nevertheless question the relevance of such arguments, notably in international campaigns.

Food choices are indeed very much influenced by cultural drivers and although personal differences such as sensitivity to the environment may also intervene (Sabate & Soret, 2014), it may very well be that a country's culinary traditions reduce or even annihilate the effectiveness of environmental arguments. Regardless of individuals realizing the urgency of the climate change issue, reducing meat consumption might be conflicting with cultural imperatives.

In this research, we compare the effectiveness of environmental appeals to reduce unsustainable meat consumption across a variety of European countries. We discuss the necessity to adapt and nuance such arguments according to the cultural determinants of a culture. More specifically, we show that beyond the country and its national culture, the individuals' cultural orientation impacts the readiness to reduce unsustainable meat consumption after exposure to an environmental appeal. As such, we contribute to the discussion on communication strategies and how to raise their effectiveness in promoting sustainable food choices.

Conceptual Framework

People's food choices are influenced by their preferences, social norms and culinary traditions (Sabate & Soret, 2014). Indisputably, cultural backgrounds influence people's food choices and food choices represent an opportunity to express one's cultural identity.

Culture is usually defined as "*the collective programming of the mind that distinguishes the members of one group or category of people from others*" (Hofstede, 2011, p.3). "*Societal cultures reside in (often unconscious) values, in the sense of broad tendencies to prefer certain states of affairs over others*" (Hofstede, 2001, p. 5). It may therefore be considered at a collective (national) level but also be at the individual level in terms of its cultural dimensions. Hoftede (2001) proposes the following 6 dimensions to differentiate cultures :

- Power Distance, i.e., the extent to which the less powerful members within a country expect and accept that power is distributed unequally,
- Uncertainty Avoidance, i.e., the extent to which the members of a culture feel threatened by uncertain or unknown situations,
- Individualism/Collectivism, i.e., the extent to which, in a given society, individuals are expected to autonomously take care of themselves and immediate family,

- Masculinity/Femininity, i.e., the extent to which the dominant sex role pattern is the male one,
- Long/ Short Term Orientation, i.e., the extent to which people's efforts focus on the future or the present and past, and
- Indulgence/Restraint, i.e., the extent to which people focus on the gratification versus control of basic human desires related to enjoying life.

When considering the cultural dimensions, specific concerns arise as to the strength of the ecological arguments to encourage a reduction of unsustainable meat consumption. For instance, it has been shown that eating meat is associated with strength and power (Love & Sulikowsli, 2018). Therefore, it may be particularly difficult for a culture high on “masculinity” to reduce meat consumption. Members of cultures that feel threatened by uncertain or unknown situations may find it particularly difficult to change their eating habits to unmastered dietary patterns. Consequently, according to one’s culture and the strength of each dimension within the culture, adopting new food consumption patterns may be quite challenging, whatever the urgency of climate change.

Method

To test the idea that the effect of an environment-related appeal to reduce unsustainable meat consumption could vary depending on culture, we collected online data via professional panel institutes in 5 European countries (e.g., Austria, Estonia, France, Portugal, Sweden). The 5 countries differ in terms of their national culture, as can be seen on Figure 1.

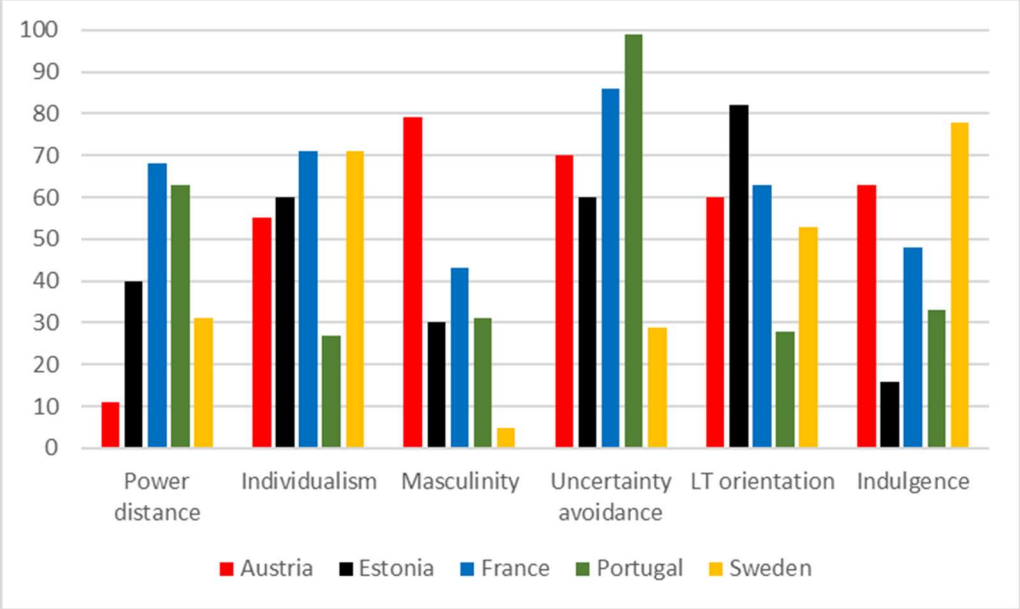


Fig.1. Differences in national culture (https://www.hofstede-insights.com/)

Stimuli. We carried out 2 studies, which were funded by the World Wild Fund for Nature (WWF) as part of its mission to stop the degradation of the planet's natural environment. In Study 1, we tested an appeal based on environmental degradation. Study 2 replicates Study 1 using an alternative type of environmental appeal based on animal welfare, as illustrated on Figure 2. These environmental appeals were presented as a WWF brochure that discussed the impact of meat consumption.

Fig.2. Examples of the stimuli developed for the purpose of the studies (not official WWF documents)

Samples. We made sure that all our respondents were non-vegetarian and familiar with the WWF. Study 1 involved 298 participants (45.6% male, average age = 44.5); Study 2 involved 294 participants (50% male, average age = 43).

Measures. Each study was presented as a survey of consumers' eating habits. After collecting participants' informed written consent and measuring their weekly frequency of meat meals, we invited them to take a close look at the WWF brochure on the impact of meat consumption. Marcus et al. (1994) stages of change scale was used to measure intention to reduce unsustainable meat consumption and adapted to encompass two objectives, i.e., adapt one's diet towards eating better meat and adapt one's diet towards eating less meat. Precisely, participants were asked to click on the answer that best describes their position among 5 alternatives, from "I do not plan to adapt my diet to eat better quality meat / less meat" to "I adapted my diet to eat better quality meat / less meat more than 6 months ago." We also measured health consciousness (Yamim et al., 2020), price consciousness (Sinha & Batra, 1999) and environmental consciousness (Lindeman & Väänänen, 2000) to be used as attitudinal control variables. Last, we collected participants' cultural values using items extracted from Yoo et al.'s (2011) CVSCALE, age, and gender.

All Likert items were measured using 7-point scales. The constructs displayed good psychographic qualities. Constructs were measured as the factors resulting from an oblimin factorial analysis (available on request).

Results

Study 1. We conducted a linear regression to explain participants' intention to adapt their diet depending on their country, age, gender, health, price and environmental consciousness, and cultural values. The linear regression was significant and showed no influence of the country on consumers' stage of change (intentions to change their diet), but a negative influence of participants' masculinity (b=-0.181, p=0.007) and of uncertainty avoidance (b=-0.112, p=0.043).

Table 1 displays the complete results of this analysis.

	Study 1 (R^2=.190)		Study 2 (R^2=.329)	
	Standardized coefficients	t	Standardized coefficients	t
(Constant)		7.858***		8.390***
Austria	-0,109	-1.433	0.031	0.469
Estonia	0,015	0.196	-0.019	-0.275
France	-0,050	-0.677	0.099	1.459
Portugal	0,022	0.307	0.049	0.767
Age	0,050	0.856	0.019	0.369
Gender	0,021	0.368	0.096	**1.843***
Environmental cs	0,344	**6.159*****	0.326	**6.311*****
Price cs	-0,115	**-1.958****	-0.219	**-4.120*****
Health cs	0,090	1.573	0.155	**2.888*****
Power distance	-0,040	-0.689	-0.1	**-1.820***
Collectivism	0,016	0.279	-0.019	-0.356
Masculinity	-0,162	**-2.718*****	-0.157	**-2.823*****
Long-term orientation	0,058	1.033	-0.003	-0.051
Indulgence	0,009	0.155	-0.01	-0.193
Uncertainty avoidance	-0,112	**-2.036****	-0.178	**-3.454*****

Table 1. Results for Study 1 and Study 2 (*** p<.01, ** p<.05, * p <.10)

Study 2. The linear regression conducted using an alternative type of environmental appeal, i.e., animal welfare, replicated Study 1's first results. It was significant and showed no influence of the country on consumers' stage of change, but a negative influence of participants' masculinity (b=-0.157, p=0.005) and of uncertainty avoidance (b=-0.178, p=0.001). Additionally, it shows a marginally significant and negative influence of power distance on consumers' stage of change (b=-0.181, p=0.007)

Discussion

Our study shows that environment-related appeals are not equally effective across cultures, or more specifically across cultural orientations associated with a culture. Importantly, it demonstrates that it is not the country but the cultural orientation that impacts this relative effectiveness. In other words, it means that a detailed knowledge of a culture, and not merely the country, enables communicators to anticipate the effectiveness of a communication campaign based on environmental arguments. As such we offer relevant theoretical and managerial contributions, especially to international NGOs managers.

Yet, follow-up studies that integrate alternative arguments to the environmental one should be conducted to precisely evaluate the strength of various arguments according to cultural dimensions. In particular, health or disgust (as recommended by Palomo-Vélez et al., 2018), or the economic impact of eating less meat, should probably also be considered for a campaign to be most effective.

Appendix 5 : Questionnaire WP2

Hello,

You have agreed to participate in a survey as part of a European research project. This project focuses on your eating habits. We thank you for your valuable collaboration!

There are no right or wrong answers, please answer as spontaneously as possible. In accordance with the GDPR (General Data Protection Regulation), your responses will be collected and processed anonymously.

Please use a computer or tablet to answer, if not possible a smartphone will suffice.

Page break

DIET

Before going any further, which of the following dietary types best describes yours?

- Omnivore: you eat everything without limit of frequency (1)
- Flexitarian: you eat meat or fish only occasionally (2)
- Pescatarian: you eat fish but not meat (3)
- Vegetarian: you eat neither meat nor fish (4)
- Vegan: you eat no animal products (meat, fish, eggs, dairy products) (5)

RANDOM Block Leaflet vs App vs Website

Page break

Our research is conducted in two stages.

We invite you to read the information brochure provided on food provided by the World Wide Fund for Nature (WWF).

In a second step, we will ask you to answer questions about the information brochure.

Please read the WWF communication medium very carefully.

The content of this part is adapter according to the communication medium exposed, in the text the words are changed by leaflet= brochure, or App (after uploaded it) and website (after opened it)

Page break

We want to gather your opinion on the information contained in the brochure *(or App or Website in accordance to the block exposed to).*

Please read the brochure.

You can consult the given brochure as many times as you want.

Page break

Guilt

Given the information provided by the WWF, how would you feel or feel about not trying to adapt your diet **to eat less meat**?

	Totally disagree (1)	(2)	(3)	Neither agree nor disagree (4)	(5)	(6)	Totally agree (7)
I would feel uncomfortable	○	○	○	○	○	○	○

Page break

Plant-based diet orientation
Given the information provided by the WWF, please click on the answer that best describes your position on plant-based alternatives to meat (lentils, peas, beans, soybeans, etc.):

- I do not intend to adapt my diet to consume **more plant-based alternatives** to meat (1)
- I am considering adapting my diet to consume **more plant-based alternatives** to meat (2)
- I intend to start adapting my diet to eat **more plant-based alternatives** to meat in the future (3)

- I started adapting my diet to eat **more plant-based alternatives** to meat in the past 6 months (4)
- I adapted my diet to eat **more plant-based alternatives** to meat more than 6 months ago (5)

Page break

Before this study, had you heard of the WWF?

- Yes (1)
- I am not sure (2)
- No (3)

Page break

Realism

Do you find the WWF brochure realistic?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all realistic	○	○	○	○	○	○	○	Perfectly realistic

Page break

Reliability

In my opinion, the information conveyed in the WWF brochure is:

	Totally disagree (1)	(2)	(3)	Neither agree nor disagree (4)	(5)	(6)	Totally agree (7)
Reliable	○	○	○	○	○	○	○

Page break

Age

What is your year of birth?

▼ 2005 (1) ... 1950 (56)

Page break

Gender

How would you describe your sexual identity?

- Male (1)
- Female (2)
- Non-binary (3)
- In another way (4)
- I prefer not to say (5)

Page break

What is your last degree obtained?

- Brevet / BEP / CAP (1)
- BAC (2)
- BTS / DUT / Licence (3)
- Master and more (4)

Page break

What is the composition of your household?

- Single adult without children (1)
- Single adult with children (2)
- Couple without children (3)
- Couple with children (4)
- Other composition without children (5)
- Other composition with children (6)

Page break

Thank you very much for your participation!

The communication medium that you were presented with was created solely for the needs of our research. It does not contain the WWF's complete recommendations on meat consumption. The real meat guide, which focuses on the environmental impact of meat, is available at: https://www.wwf.fr/agir-au-quotidien/alimentation/viande.

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