



The Possibility of Immediate Meat Intake Reduction in pathways toward a healthy diet

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► To cite this version:

Elie Perraud, Juhui Wang, Alison Dussiot, Hélène Fouillet, François Mariotti. The Possibility of Immediate Meat Intake Reduction in pathways toward a healthy diet. NUTRITION 2023, Jul 2023, Boston (MA), United States. hal-04186262

HAL Id: hal-04186262

<https://hal.inrae.fr/hal-04186262>

Submitted on 23 Aug 2023

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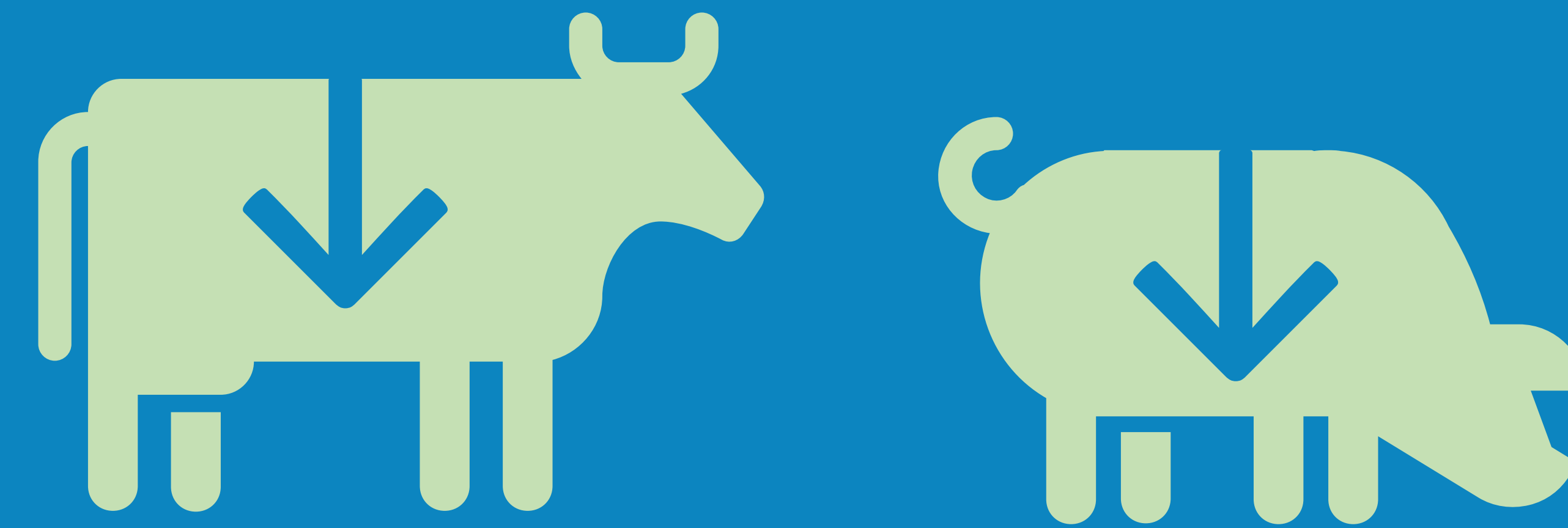
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The Possibility of Immediate Meat Intake

Reduction in pathways toward a healthy diet



Background:

- In Western countries, **reducing total red meat (red and processed meats)** consumption is becoming more **popular**.
- The importance of **meat** has been pointed out for **nutritional** adequacy.

Objective: Understand if there is a **risk** with the direct **diminution of total red meat** and what steps should be introduced to make this diminution possible.

Methods:

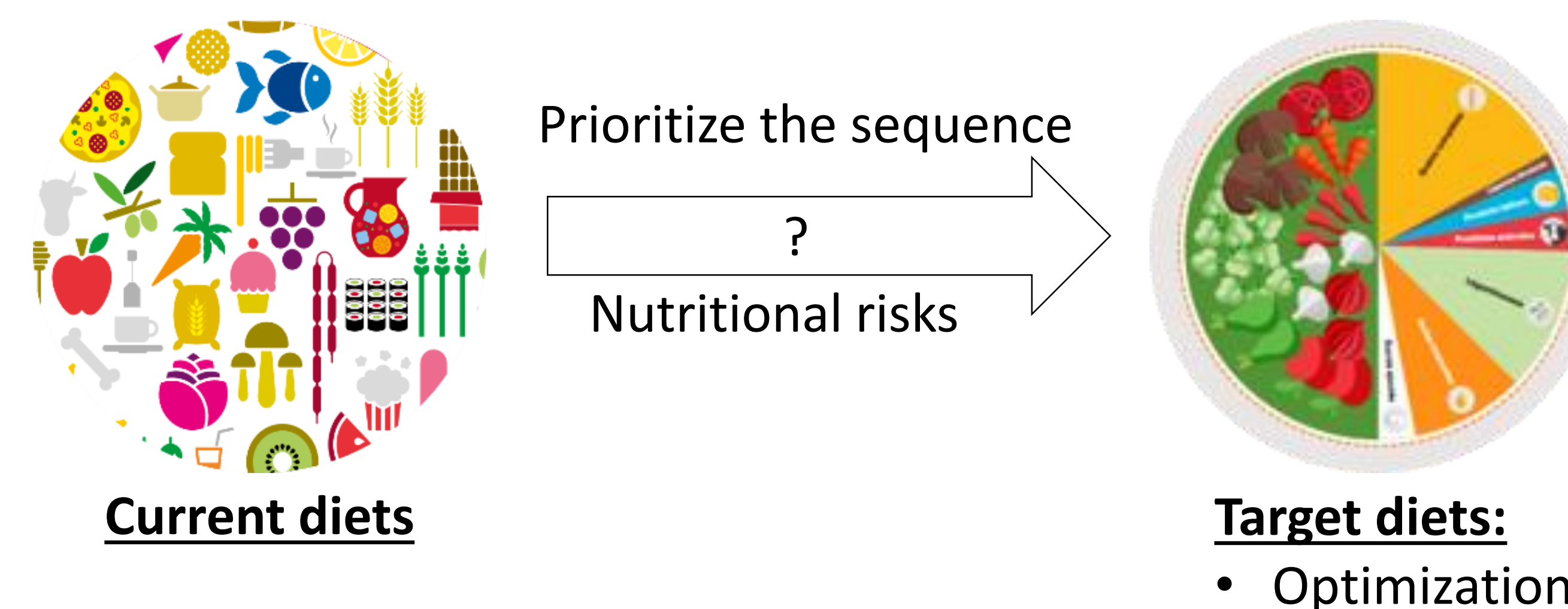
- A **new method** developed using **graph theory**
- Pathways all avoiding the risk of nutrient deficiency
- Identified and characterized the trajectory that **reduces total red meat** consumption as **quickly** as possible.
- The best pathways were found using the **Dijkstra algorithm**.

Results:

- The number of **total red meat portions** consumed is **0, 3, and 3** for **males'** observed diets (low-meat, mean, high-meat) and **0, 2, and 3** for **females'** observed diets (low-meat, mean, high-meat).
- For each graph having an observed diet with red meat intake, the first step was the diminution of this consumption.
- Conclusions:**
- Total red meat** can be **decreased** with specific increases, especially fruit, vegetable, and fish.
- Bioavailable iron** adequacy is a **major limit** in total red meat reduction for women.

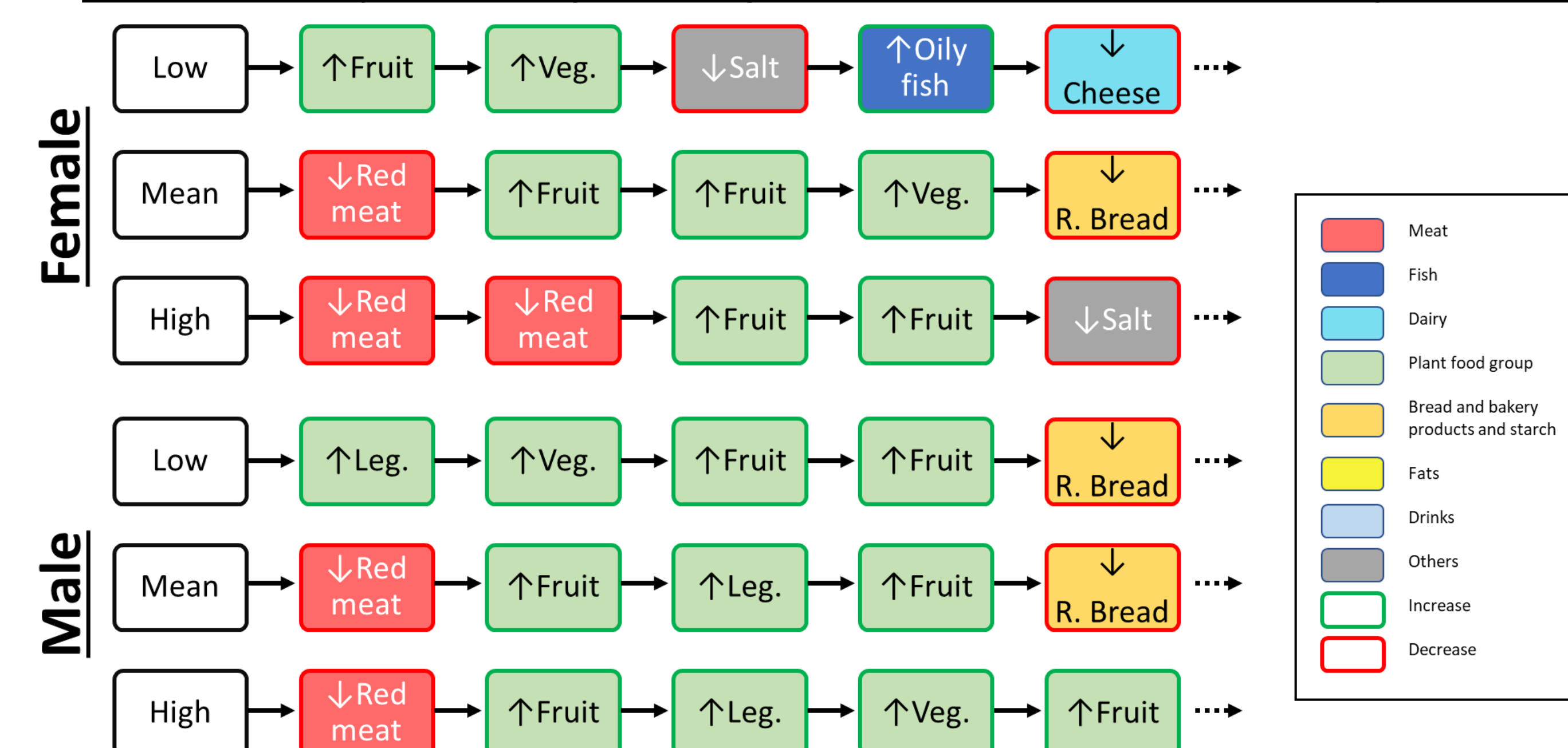
Introduction

- In Western countries, **reducing total red meat (red and processed meats)** consumption is becoming more **popular**.
- The importance of **meat** has been pointed out for **nutritional** adequacy.

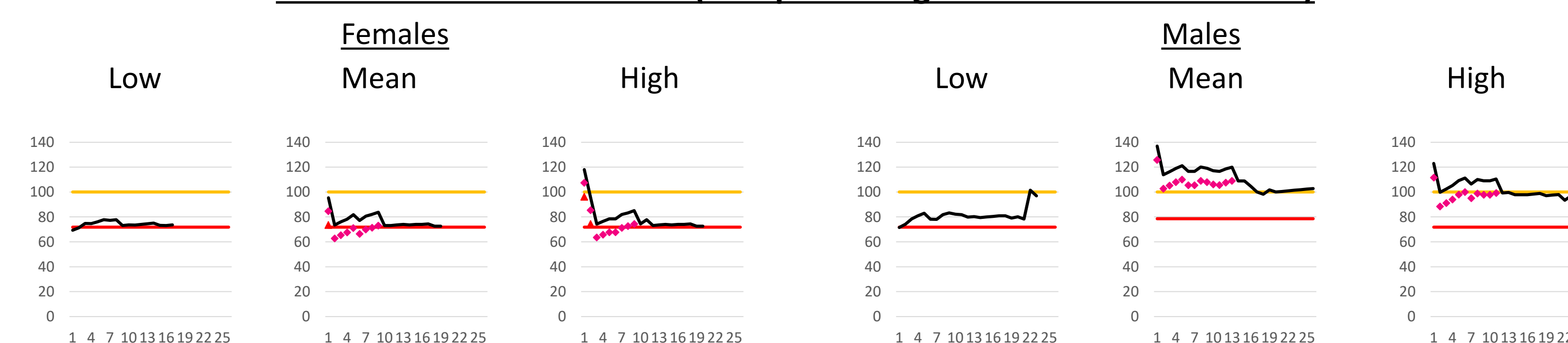


Results

First five steps of the pathways identified based on the optimization criteria



Intake of bioavailable iron (as a percentage of the reference value)



Step of the trajectory

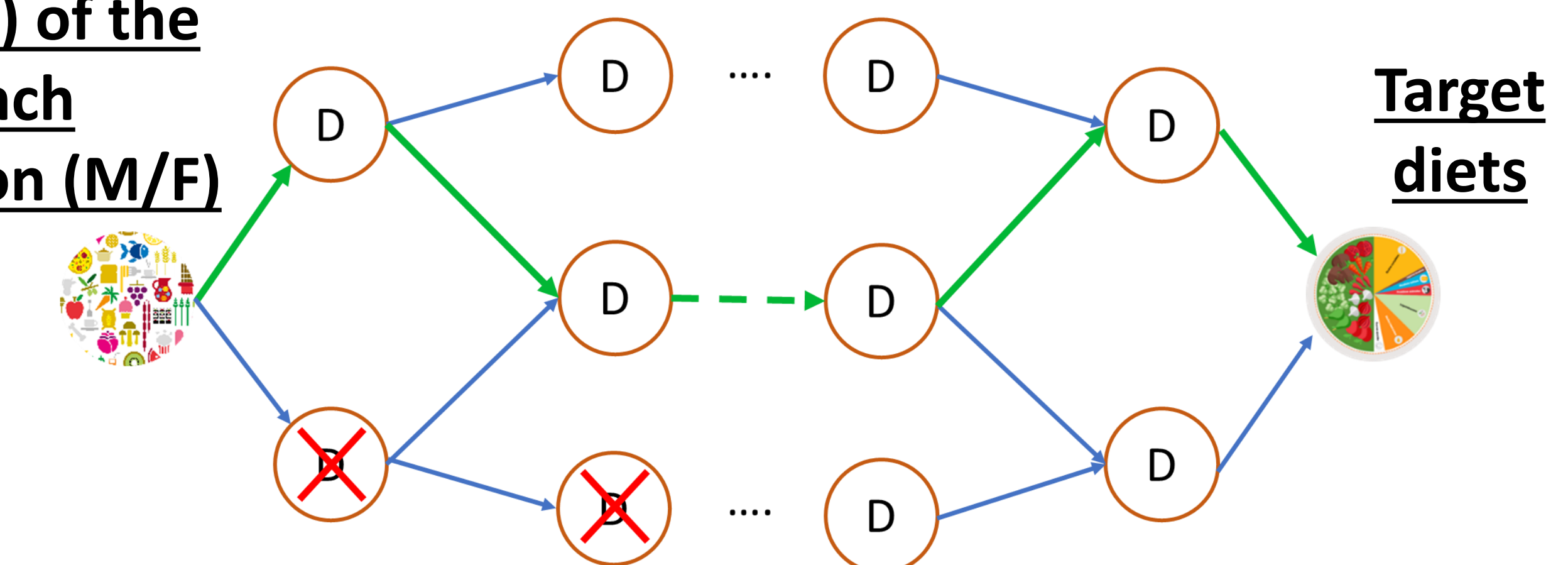
Methods

Optimization criteria:

Meat quantity (MQ),
Health score (HR): TMREL, DALYs

$$\text{Score} = \text{MQ}(100-1e-8) + \text{HR}(1e-8)$$

Q1 (low), Mean, Q5 (high) of the French population (M/F)



Optimal pathway:
Dijkstra algorithm

Constraint application:
Risk of nutrient deficiency

Graph theory

D Diet: vector of 33 food groups
Dietary change: 1 portion step

Conclusion

- Red meat can be decreased in the first steps of the pathways.
- Total red meat can be minimized in the first 13 steps of the pathways.
- Fish, fruit, and vegetable are the most efficient substitutions in the pathways to reduce meat consumption.
- Bioavailable iron is an important limitation toward meat reduction for females.



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Nutrition 2023 – July 22-25 – Boston – P14-074-23