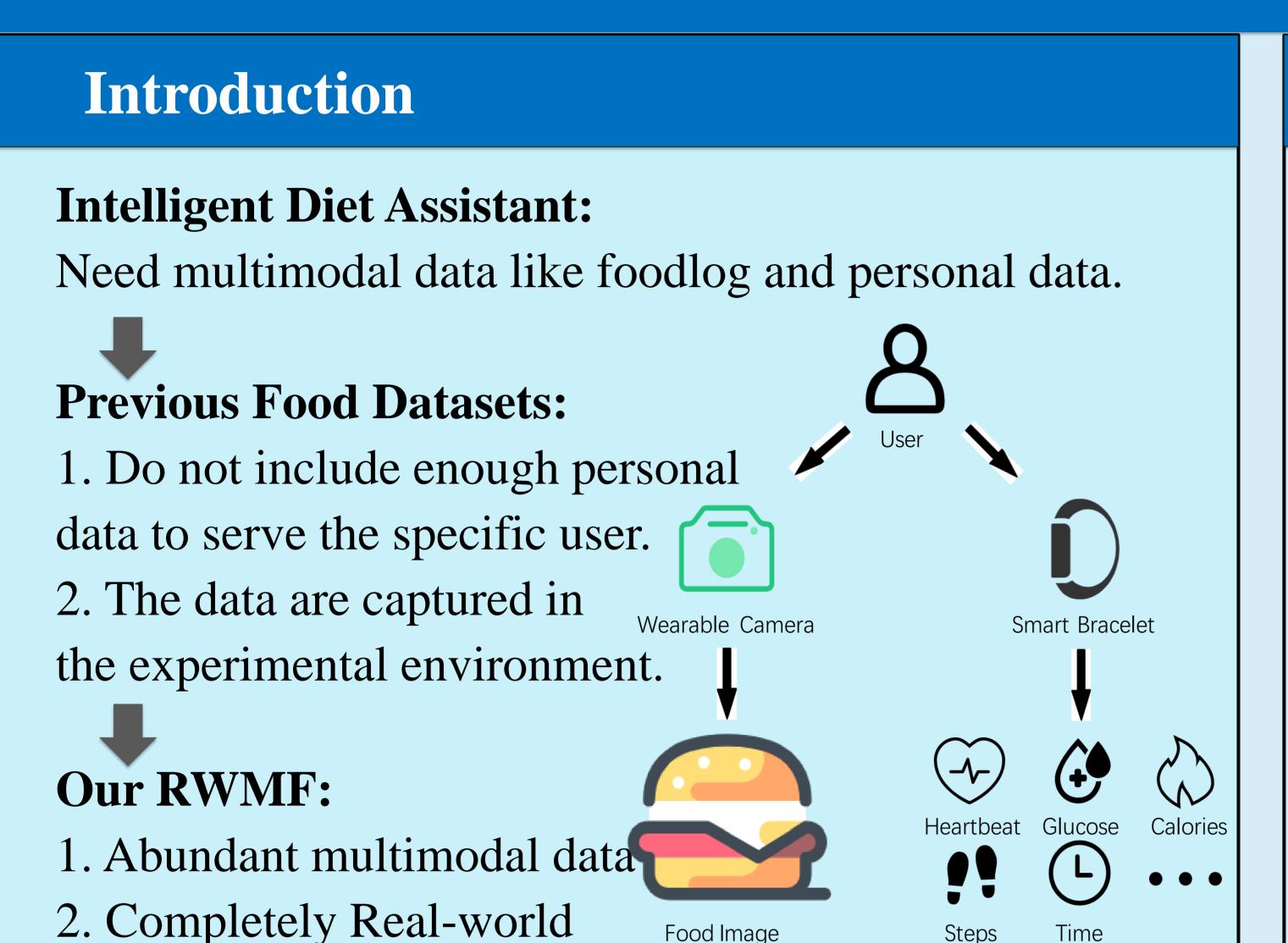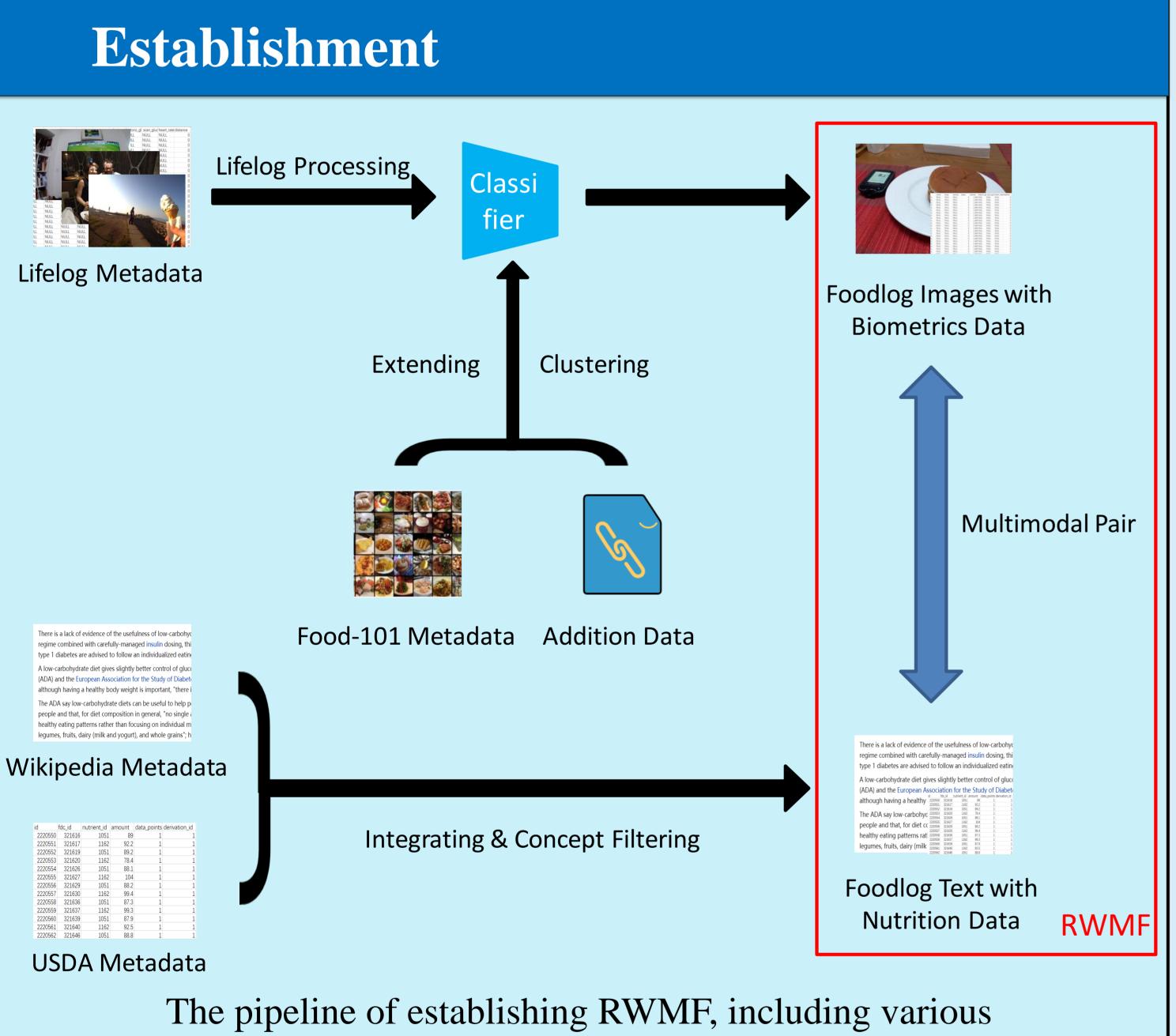# RWMF: A Real-World Multimodal Foodlog Database

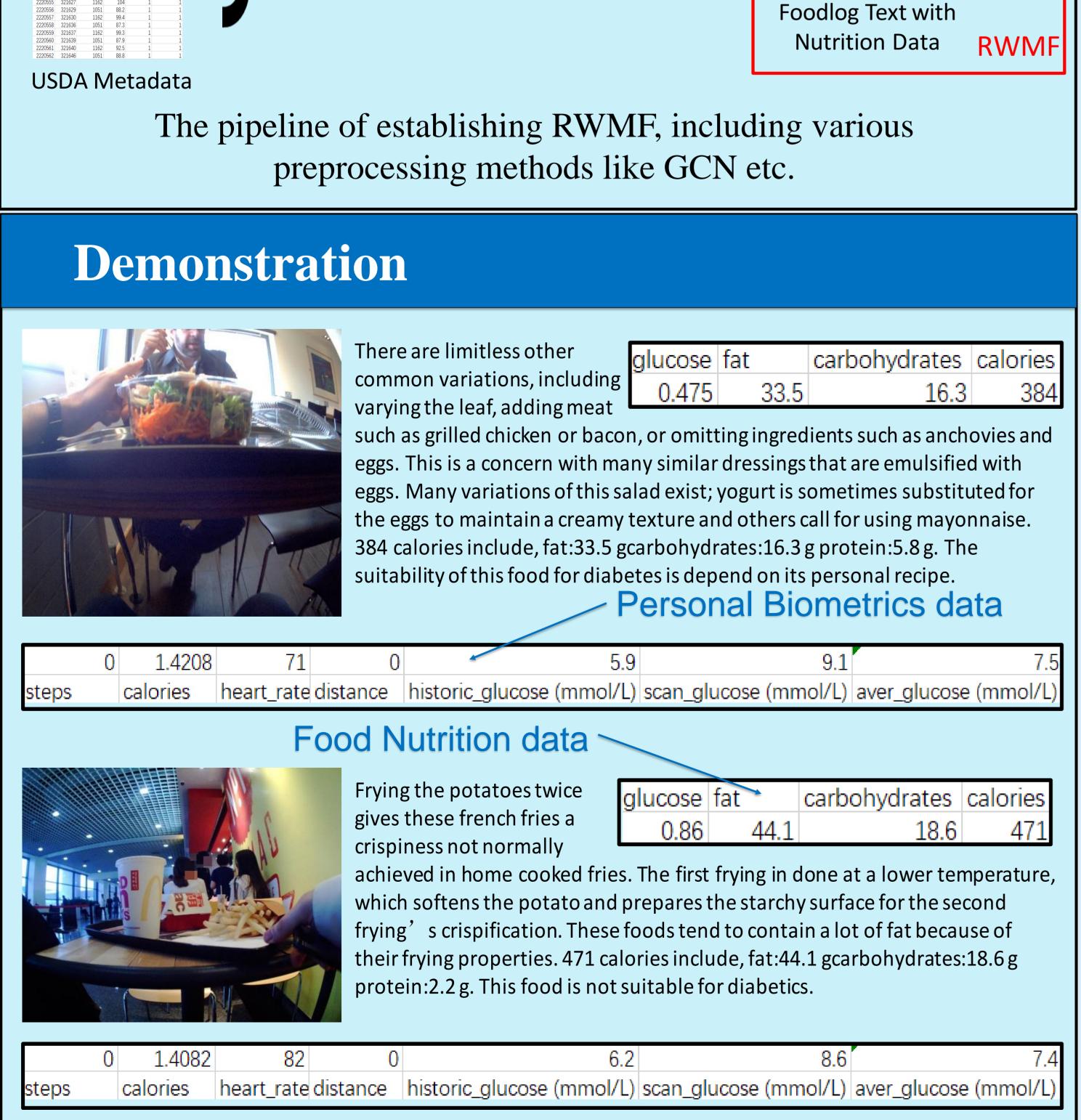Pengfei Zhou, Cong Bai*, Kaining Ying, Jie Xia and Lixin Huang
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Introduction

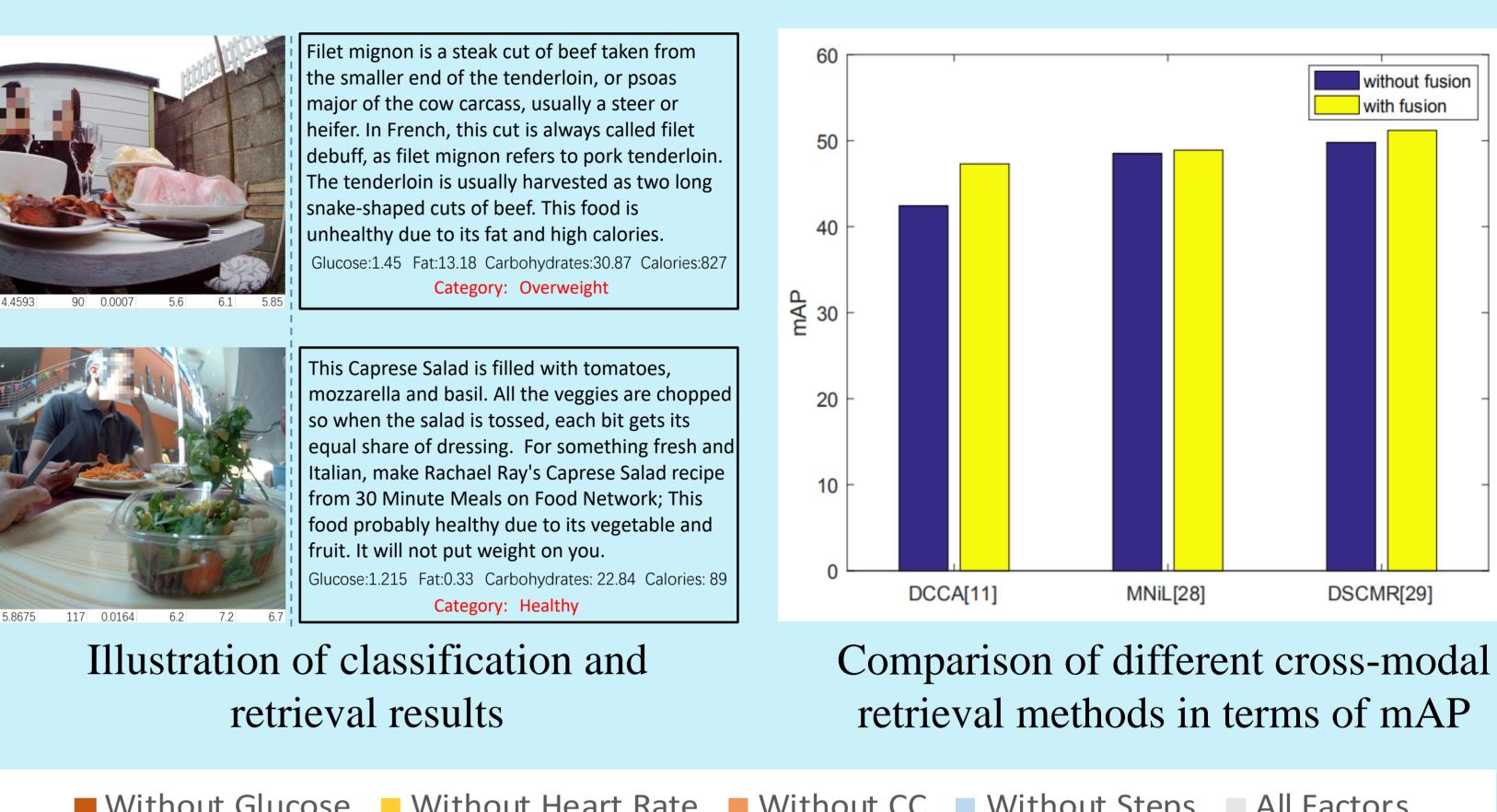**Intelligent Diet Assistant:**

Need multimodal data like foodlog and personal data.

Previous Food Datasets:

1. Do not include enough personal data to serve the specific user.

2. The data are captured in the experimental environment.

Our RWMF:

1. Abundant multimodal data

2. Completely Real-world

Establishment

The pipeline of establishing RWMF, including various preprocessing methods like GCN etc.

Demonstration

There are limitless other common variations, including varying the leaf, adding meat such as grilled chicken or bacon, or omitting ingredients such as anchovies and eggs. This is a concern with many similar dressings that are emulsified with eggs. Many variations of this salad exist; yogurt is sometimes substituted for the eggs to maintain a creamy texture and others call for using mayonnaise. 384 calories include, fat:33.5 gcarbohydrates:16.3 g protein:5.8 g. The suitability of this food for diabetes is depend on its personal recipe.

glucose	fat	carbohydrates	calories
0.475	33.5	16.3	384

Personal Biometrics data

0	1.4208	71	0	5.9	9.1	7.5
steps	calories	heart_rate distance		historic_glucose (mmol/L)	scan_glucose (mmol/L)	aver_glucose (mmol/L)

Food Nutrition data

Frying the potatoes twice gives these french fries a crispiness not normally achieved in home cooked fries. The first frying in done at a lower temperature, which softens the potato and prepares the starchy surface for the second frying's crispification. These foods tend to contain a lot of fat because of their frying properties. 471 calories include, fat:44.1 gcarbohydrates:18.6 g protein:2.2 g. This food is not suitable for diabetics.

glucose	fat	carbohydrates	calories
0.86	44.1	18.6	471

0	1.4082	82	0	6.2	8.6	7.4
steps	calories	heart_rate distance		historic_glucose (mmol/L)	scan_glucose (mmol/L)	aver_glucose (mmol/L)

Results

The established RWMF includes 7500 multimodal pairs.

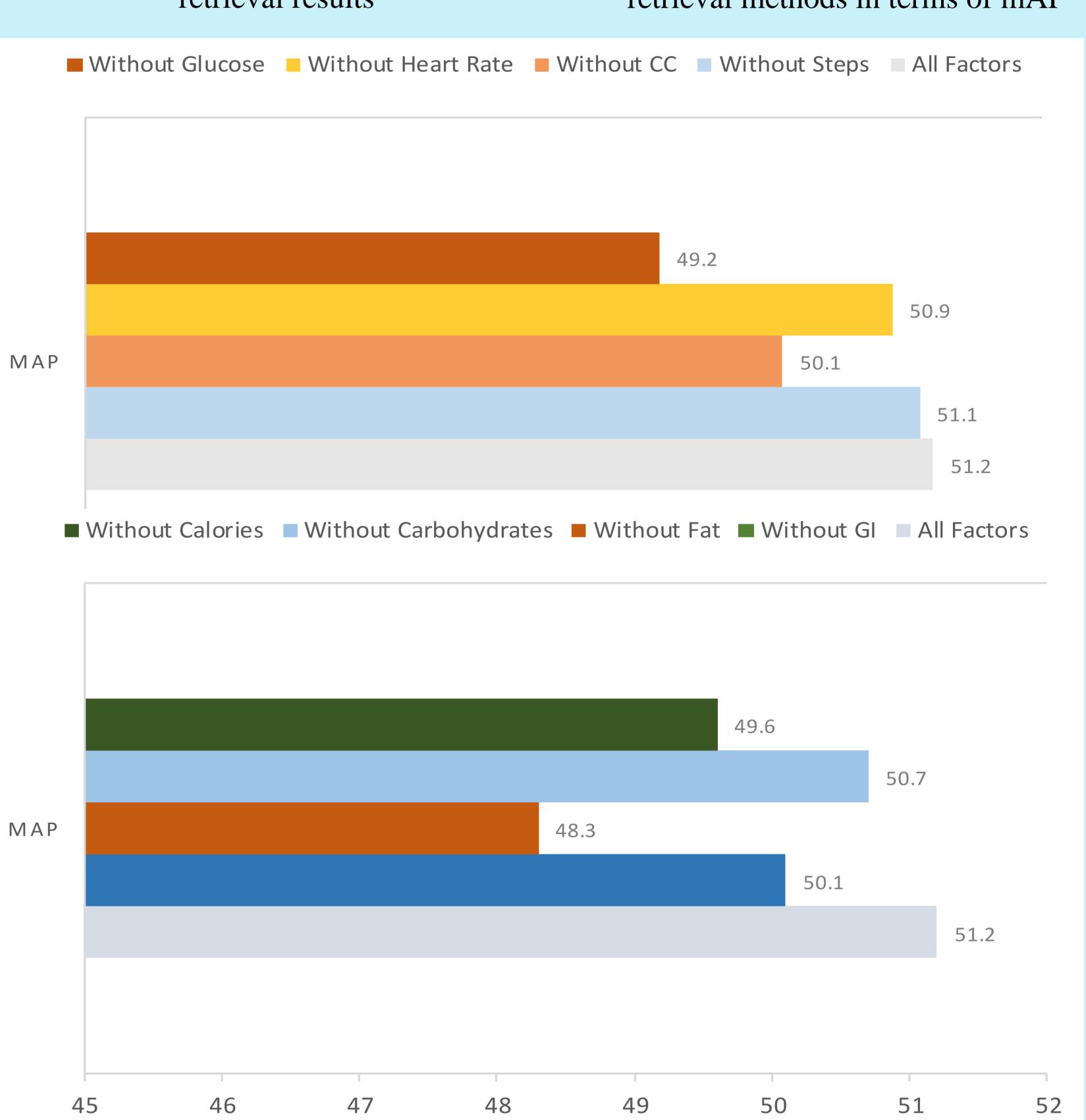Each pair: a food image with personal biometrics data / a textual food description with food nutrition data.

Three health-related main categories: Healthy, Overweight and Other.

Comparison of food classification results using different methods

Datasets	Methods	Accuracy	Precision	Recall	F1
RWMF	SVM	83.97%	0.75	0.71	0.73
	SVM-fusion	85.21%	0.78	0.74	0.76
	VGG	76.84%	0.45	0.58	0.51
	ResNet-50	80.26%	0.65	0.66	0.65
	Inception-v3	82.13%	0.70	0.73	0.71
Food-101	ResNet-50	90.64%	0.85	0.86	0.86

Filet mignon is a steak cut of beef taken from the smaller end of the tenderloin, or psoas major of the cow carcass, usually a steer or heifer. In French, this cut is always called filet debuff, as filet mignon refers to pork tenderloin. The tenderloin is usually harvested as two long snake-shaped cuts of beef. This food is unhealthy due to its fat and high calories.
Glucose:1.45 Fat:13.18 Carbohydrates:30.87 Calories:827
Category: Overweight

This Caprese Salad is filled with tomatoes, mozzarella and basil. All the veggies are chopped so when the salad is tossed, each bit gets its equal share of dressing. For something fresh and Italian, make Rachael Ray's Caprese Salad recipe from 30 Minute Meals on Food Network; This food probably healthy due to its vegetable and fruit. It will not put weight on you.
Glucose:1.215 Fat:0.33 Carbohydrates: 22.84 Calories: 89
Category: Healthy

Illustration of classification and retrieval results

Comparison of different cross-modal retrieval methods in terms of mAP

■ Without Glucose ■ Without Heart Rate ■ Without CC ■ Without Steps ■ All Factors

- 49.2
- 50.9
- 50.1
- 51.1
- 51.2

■ Without Calories ■ Without Carbohydrates ■ Without Fat ■ Without GI ■ All Factors

- 49.6
- 50.7
- 48.3
- 50.1
- 51.2

The performance cross-modal retrieval when each kind of data is removed. The CC means the calories consumption and the GI means the Glycemic Index.