



# AI-assisted food tracking to revolutionize nutritional research

[www.aifornutrition.org](http://www.aifornutrition.org)



# The Problem

The world's healthcare systems are being overwhelmed with non-communicable diseases strongly associated with unhealthy diets.

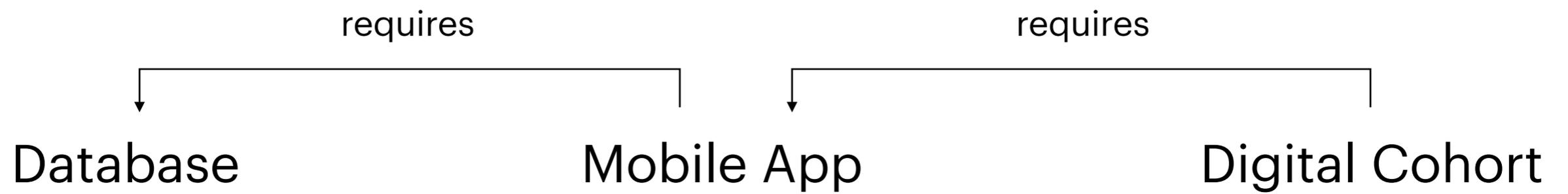
What constitutes unhealthy diets is a non-trivial question. First, much of the previous work on nutritional epidemiology is currently being questioned on methodological grounds<sup>1</sup>. Second, there is increasing evidence for high interpersonal variability, leading to the concept of personalized nutrition<sup>2</sup>.

<sup>1</sup> Ioannidis, J. P. (2018). The challenge of reforming nutritional epidemiologic research. *Jama*, 320(10), 969-970.

<sup>2</sup> Ordovas, J. M., Ferguson, L. R., Tai, E. S., & Mathers, J. C. (2018). Personalised nutrition and health. *bmj*, 361, bmj-k2173.



# Strategy



FoodRepo



MyFoodRepo



Food & You





# Food & You

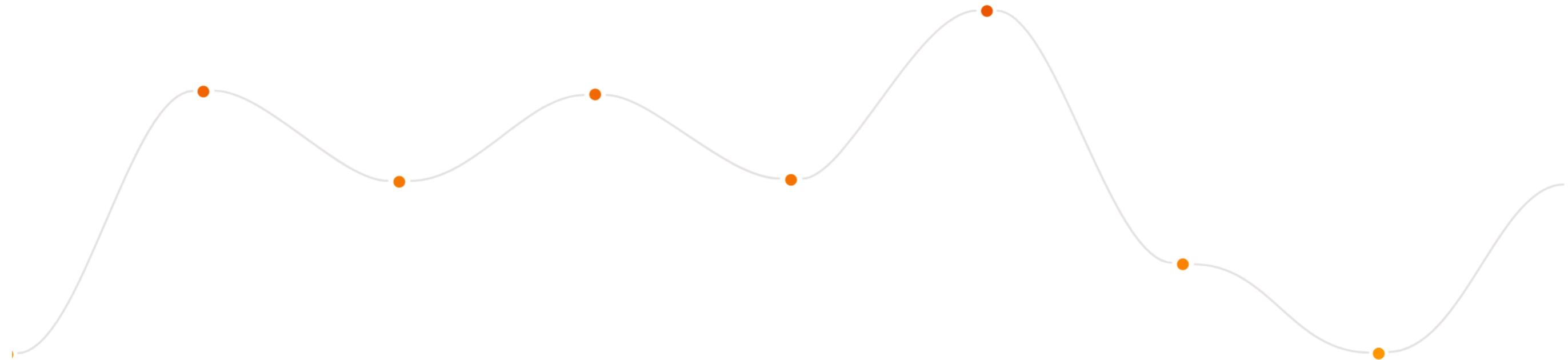
Food & You is a citizen science project on personalized nutrition to study individual blood sugar responses. The project is coordinated entirely digitally through a web platform and the smartphone app MyFoodRepo.



[www.foodandyou.ch](http://www.foodandyou.ch)



# Track your individual response to food and help advance science



Citizen Science



Nutrition



Blood Sugar



Microbiome



Lifestyle



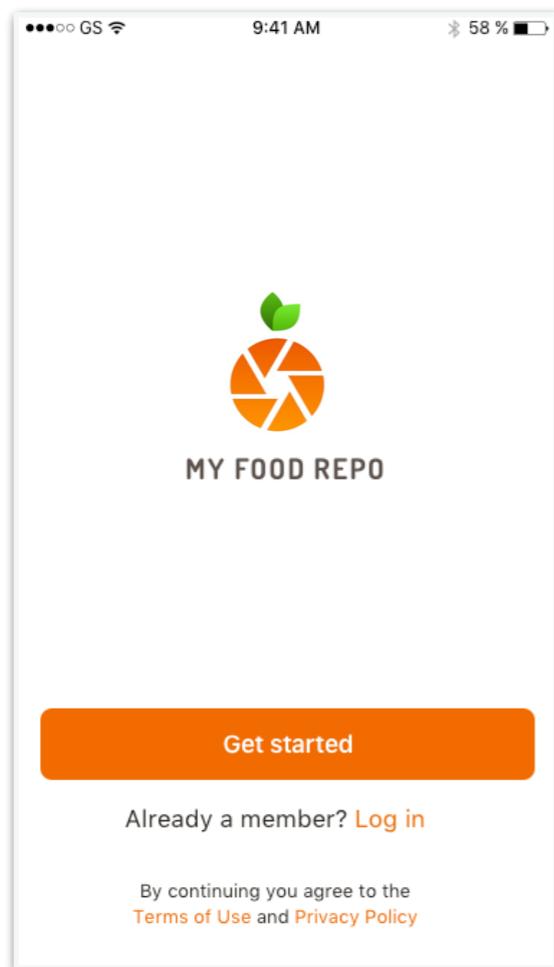
Dietary  
intake



Blood  
sugar



Microbiome



+



+

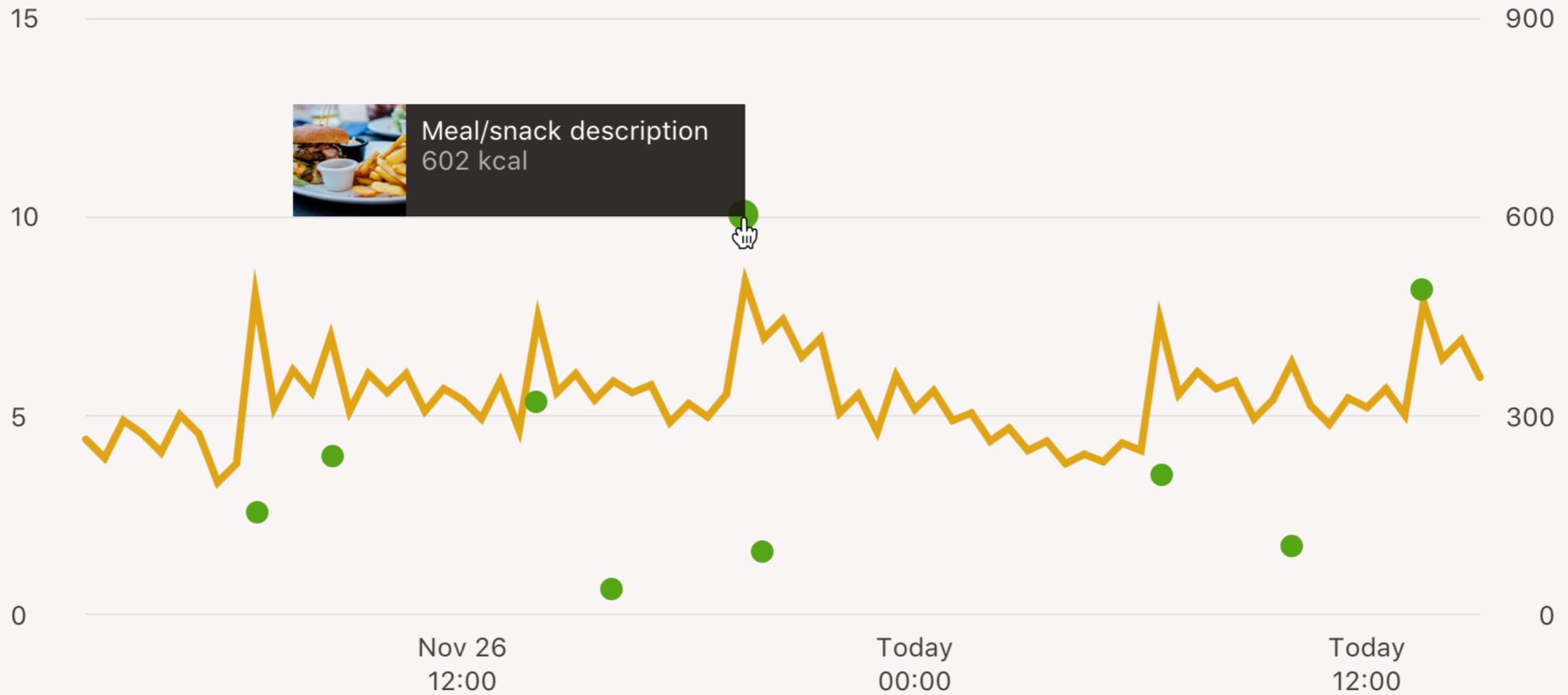


First “digital” personalized health cohort in CH to assess effect of microbiome on individual glucose response.

# Glucose (mg/dL) & consumption

Energy (kcal) ▾

What did I eat? ▾

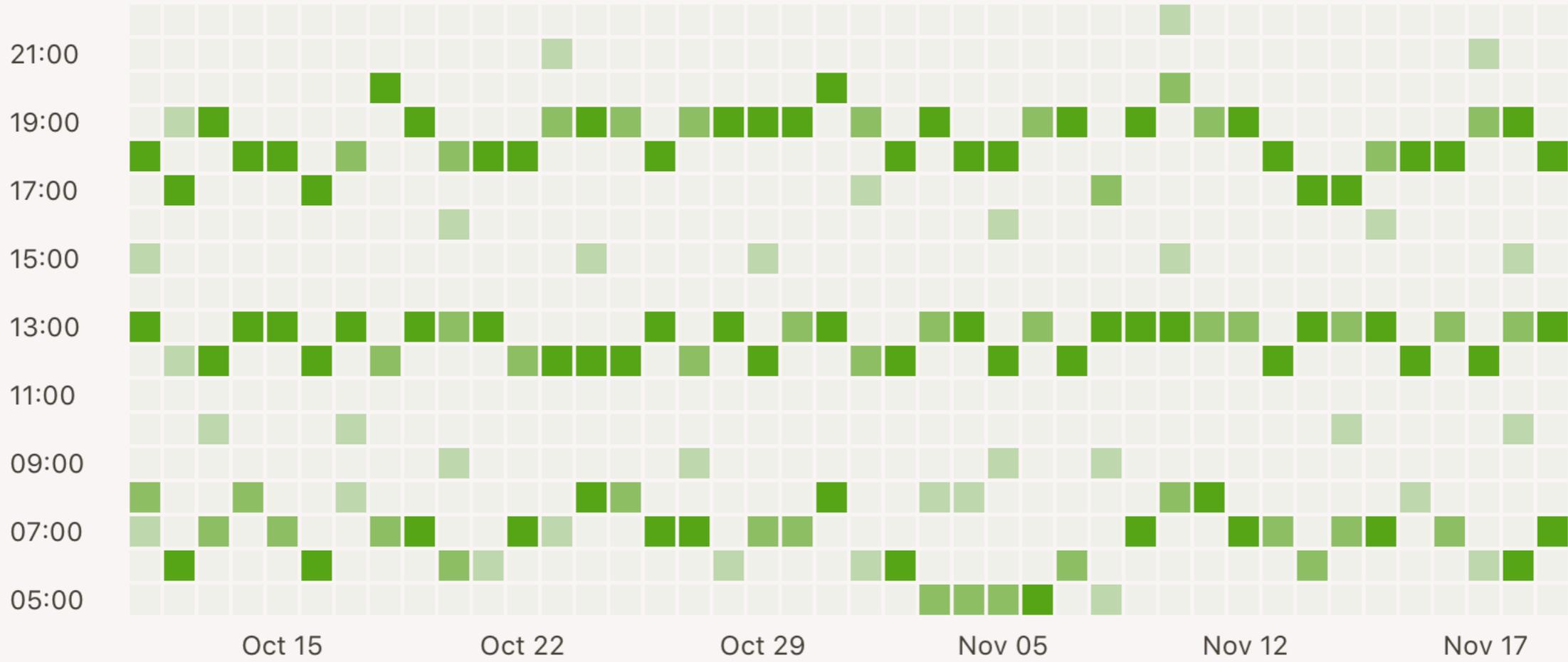


● Glucose (mg/dL) ● Energy (kcal)



# Energy consumption (kcal)

When did I eat? ▾



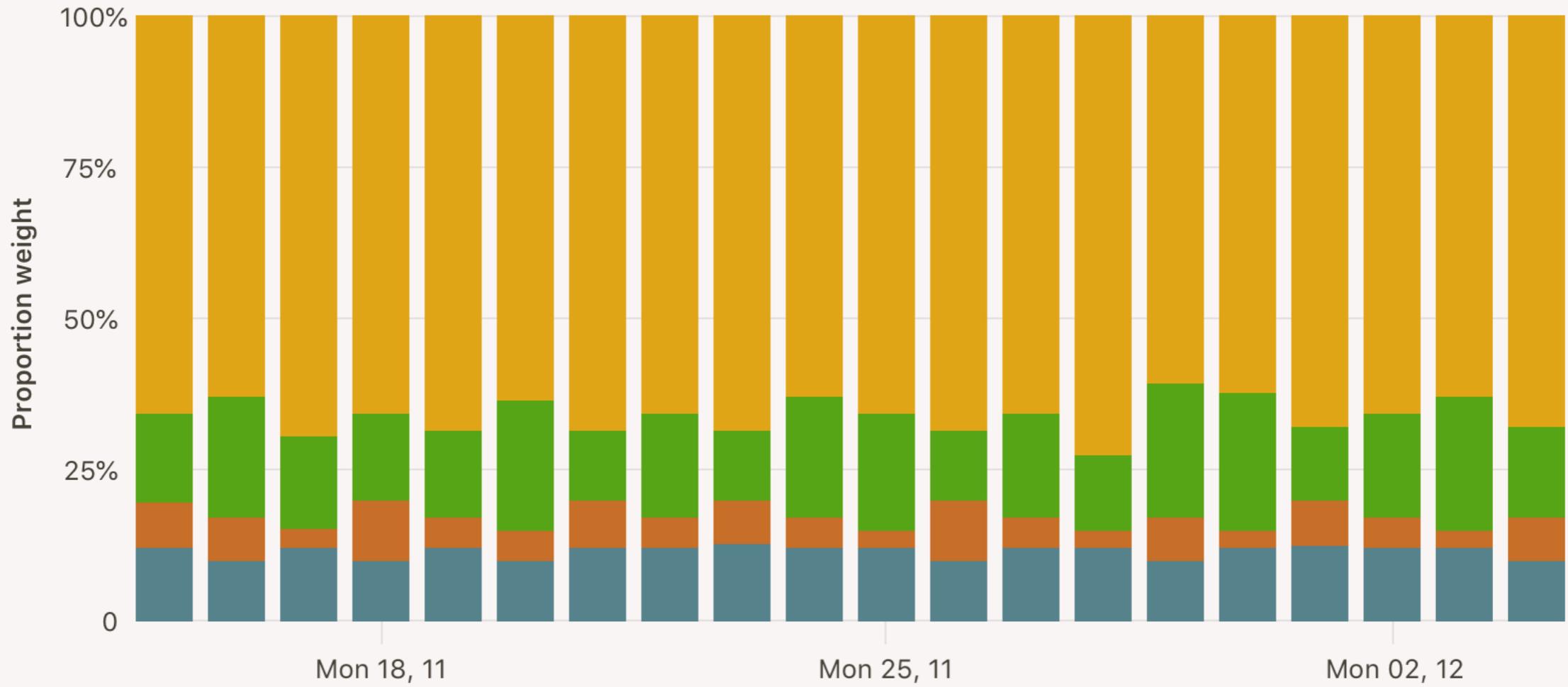
⋮

1-499 (kcal) 500-999 (kcal) 1,000-1,500 (kcal)

# Consumption

Nutritional values ▼

What did I eat? ▼



Macronutrients: ■ Carbohydrates ■ Fat ■ Protein ■ Fiber



# Traditional Cohorts



Food surveys

Blood glucose levels

Demographics

Microbiome



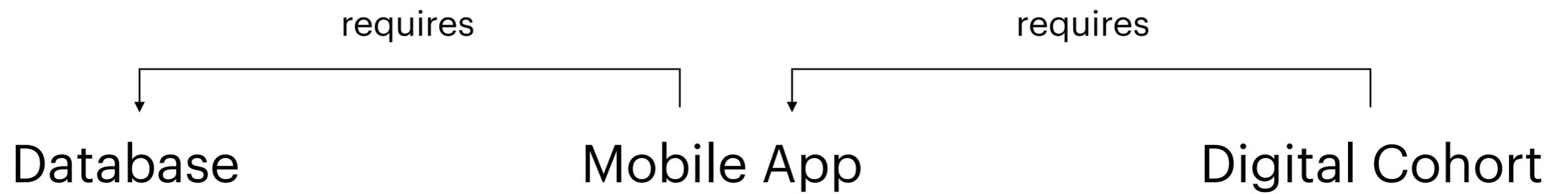


# Digital Cohorts





# Strategy



FoodRepo



MyFoodRepo



Food & You





# FoodRepo

The Open Food Repo is an independent and community-driven open database for barcoded food products.



[www.foodrepo.org](http://www.foodrepo.org)



# A community-driven open database for barcoded food products

Use Food Repo data to make better food choices or to build an app.  
Contribute to it by improving the data as a community member.

[Contribute](#)[Learn more ▾](#)

41,510

Products added

1.54M

API requests

23,958

Open tasks

5,805

Contributions

## Community

### Latest contributions



[bryan morris](#) Added weight/volume to [/ch/products/15982](#)  
about 1 hour ago



[tyzess](#) Added weight/volume to [/ch/products/15989](#)  
about 1 hour ago



[bryan morris](#) Added weight/volume to [/ch/products/15982](#)

## Community

### Top contributors



[Tacite](#)  
★ 417 points



[Marina Secat](#) editor  
★ 267 points



[Gili](#) admin



Developers

## Use our data for your apps

We at Food Repo strongly believe in open data delivered using open source technologies and open web standards. The Food Repo API allows full access to all of the content available in our database, including powerful search tools and full-resolution images.

[API Documentation](#)

```
1  const request = require('request' 2.88.0 );
2
3  const options = {
4    url: 'https://www.foodrepo.org/api/v3/products/971',
5    headers: {'Authorization': 'Token
6             token=0b1f591017364a0bf22586b3fbfd65af'} // Demo API KEY
7  };
8  request.get(options, function(error, response, body) {
9    const info = JSON.parse(body);
10   console.log(info.data);
11  });
12  // Click '▶ run' to try this code live
```

Powered by **RunKit**

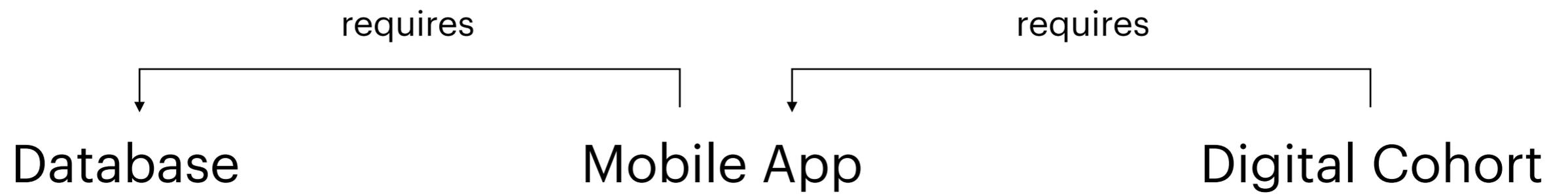
Node 10 ↕

help

▶ run



# Strategy



FoodRepo



MyFoodRepo



Food & You





# MyFoodRepo

MyFoodRepo is a smartphone app that tracks food consumption. The app uses artificial intelligence to analyze the photos of meals as well as barcode information from the Open Food Repo database.





# MyFoodRepo

The **MyFoodRepo** platform helps individuals track their food consumption with a mobile app (“take a picture, done”).



The platform is used today by clinical cohorts in Switzerland, and thus by patients on a daily basis.

5:52

4G

# Timeline

Track

All

Pending Action

SATURDAY OCTOBER 19, 2019

-  22:09 coop Qualité & Prix BRANCHE CLASSIC CHOCOLAT AU LAIT >
-  20:08 Wine, red >
-  19:06 Salad dressing n.s., Salad, leaf / salad, green n.s. >
-  18:57 Water n.s. >
-  18:57 Tuna, Tomato sauce, Pasta, penne >
-  13:50 Coffee, with caffeine >
-  13:20 French salad dressing, Salad, leaf / salad, green n.s. >
-  13:20 Fermenting wine, with alcohol (CH) >
-  13:20 Grapes, Venison, cutlet, Pasta, linguini, parpadelle, Tagliatelle,... >
-  10:00 Coffee, with caffeine >



Main



Statistics



Cohorts



Settings



More



5:52

4G

Cohorts

Subscribe

YOUR COHORTS



Food & You

Internal



Main



Statistics



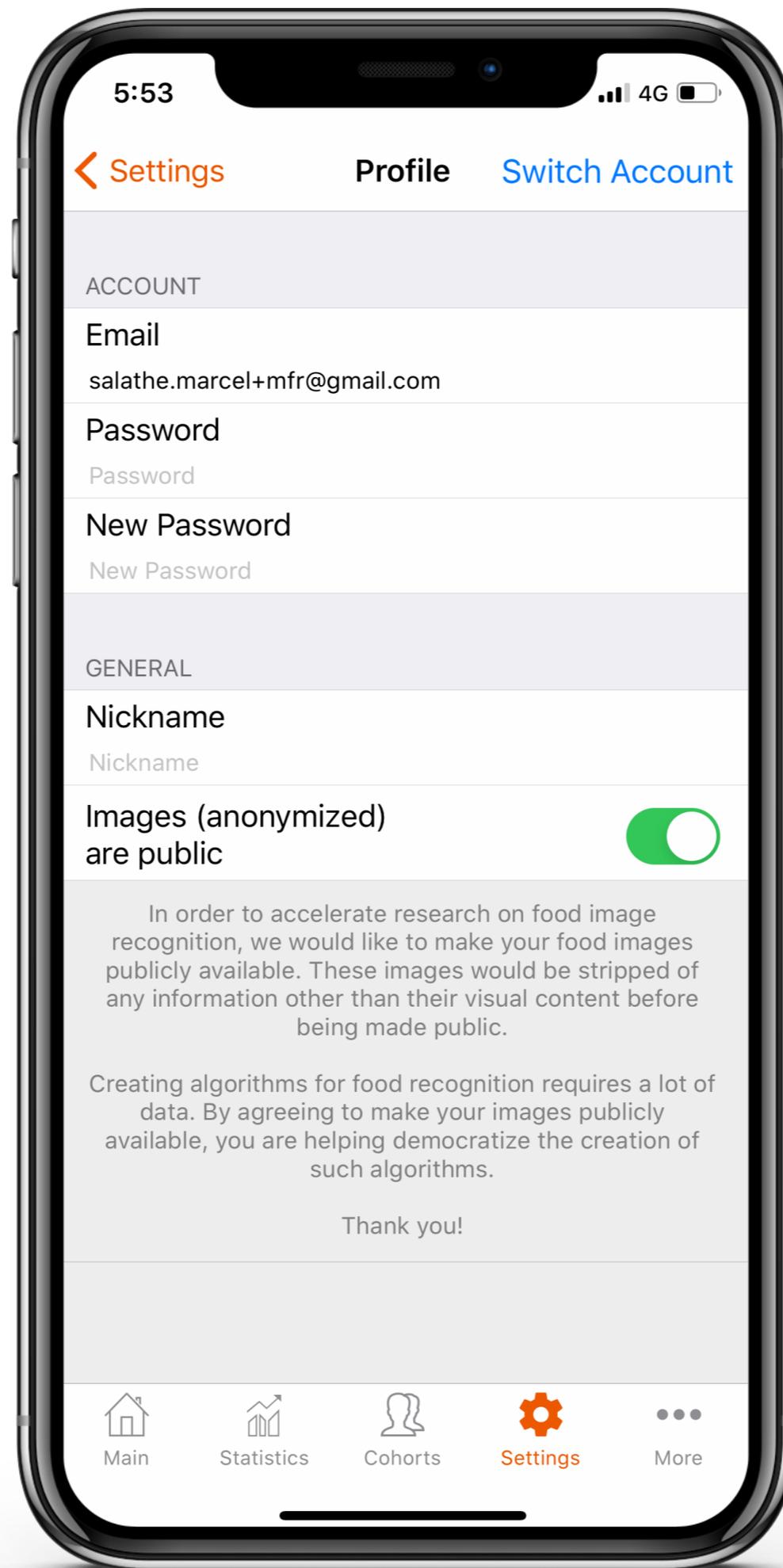
Cohorts



Settings



More



5:53

4G

Settings Profile Switch Account

ACCOUNT

Email

salathe.marcel+mfr@gmail.com

Password

Password

New Password

New Password

GENERAL

Nickname

Nickname

Images (anonymized) are public



In order to accelerate research on food image recognition, we would like to make your food images publicly available. These images would be stripped of any information other than their visual content before being made public.

Creating algorithms for food recognition requires a lot of data. By agreeing to make your images publicly available, you are helping democratize the creation of such algorithms.

Thank you!



Main



Statistics



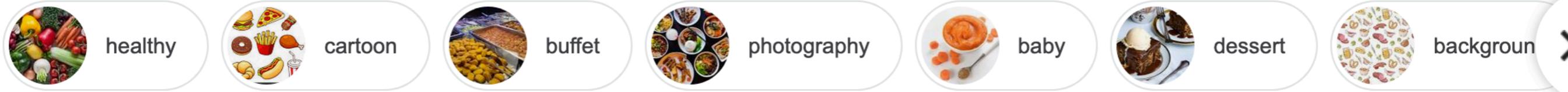
Cohorts



Settings



More



Food - Wikipedia en.wikipedia.org



The New Canada Food Guide 201... chatelaine.com



Best Black Friday Food Deals 2018 ... thrillist.com



Teen goes blind after eating junk food ... nypost.com



junk food could help save the environment phys.org



The Worst Foods to Eat and The Best ... foodrevolution.org



Junk food is deadlier than what it was ... timesofindia.indiatimes.com



- diet
- healthy
- japanese
- bangladeshi
- dinner
- chinese
- nutrition



Organic Vs. Regular Food—What's... psychologytoday.com



Superfoods vs a balanced diet: which... valleyleisurelifestyle.wordpress.com



Your guide to getting enough fib... healthyfood.com



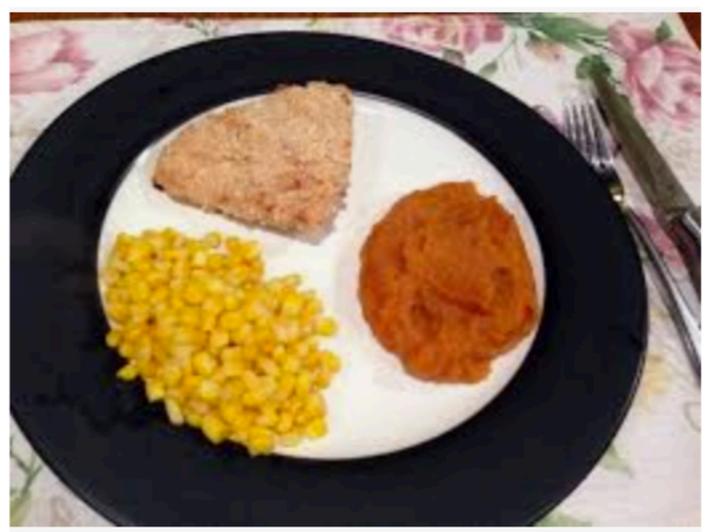
Organic Foods vs Regular Conventional ... thediabetescouncil.com



regular food for lunch | Fernando Ysais ... flickr.com



School Caterers schoolcaterers.com



Forgetting What Regular Food Looks Like ... sweettoothsweetlife.com



Gluten-free food isn't healthier fo... independent.co.uk



# Review Dish #74329

## Eaten *(in User's time zone)*

Saturday, October 26, 2019 2:06 PM (UTC+02:00)

## User

(redacted)

## Status

Pending Annotation

## Segmentation (0.3)

### Dish Foods

1. Red cabbage



+ Add a dish food

### Dish Food 01 🗑️



Red cabbage ▼

#### Present unit

Grams

Deciliters

#### Present amount

120

Grams

#### Eaten unit

g

dl

%

#### Eaten amount

100

%

### Dish Food 01 Segment 01 ✎ 🗑️

ML Confidence: 1.48%

Sync with Dish Food "Present" Amount?

#### Visible unit

#### Visible amount

# Review Dish #73172

## Eaten *(in User's time zone)*

Tuesday, October 22, 2019 9:05 PM (UTC+02:00)

## User

(redacted)

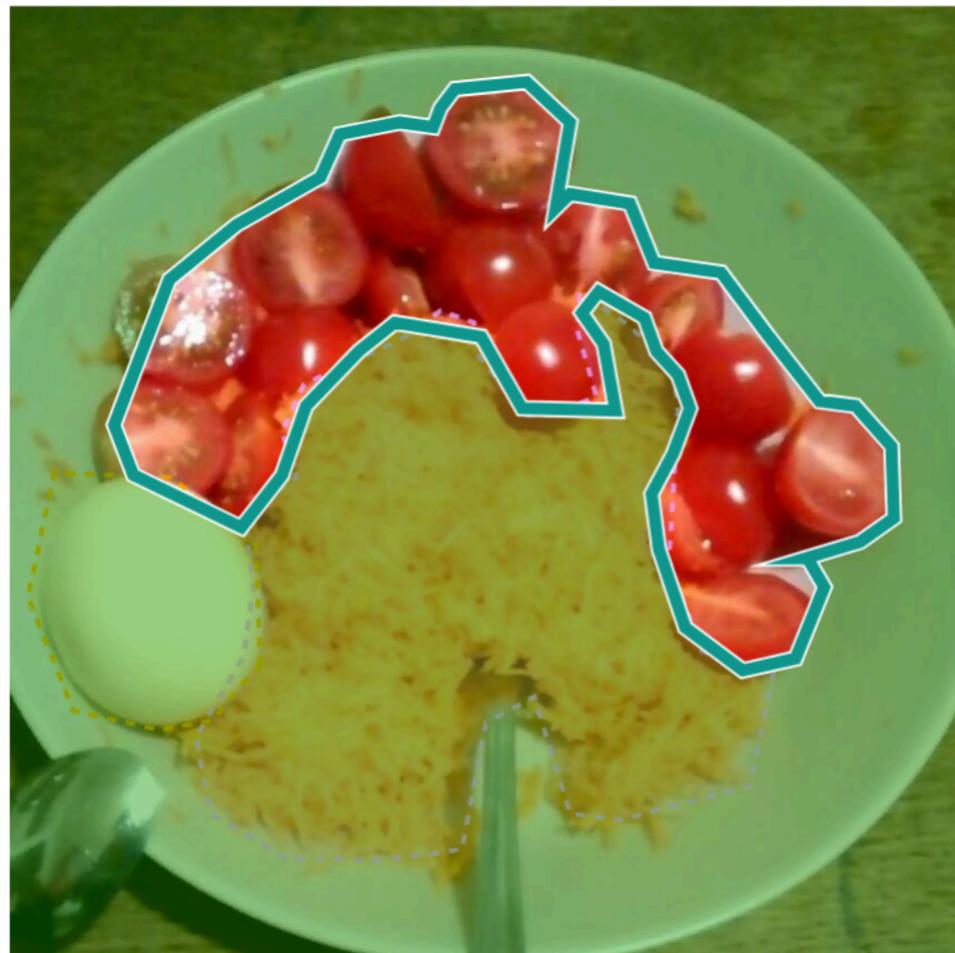
## Status

OK

## Segmentation (0.3)

### Dish Foods

- 1.  Tomato
- 2.  Carrot
- 3.  Egg
- 4. Oil, olive
- 5. Juice, lemon



+ Add a dish food

### ● Dish Food 01 🗑️

#### Present unit

#### Present amount

#### Eaten unit

#### Eaten amount

### ● Dish Food 01 Segment 01 ✎ 🗑️

ML Confidence: 0.93%

Sync with Dish Food "Present" Amount?

#### Visible unit

#### Visible amount



# Food Recognition Benchmark

Goal: to use the open, annotated food data to crowdsource AI development.

<https://www.aicrowd.com/challenges/food-recognition-challenge>

Round 1: Completed

Round 2: 93 days left

# Food Recognition Challenge

A benchmark for image-based food recognition



By Seerave Foundation

7042

228

356

19

Follow

- ✈ 1 Travel Grants
- 📄 1 Authorship/Co-Authorship
- Misc Prizes : Various Prizes

Overview **Leaderboard** Discussion Resources Submissions

Participate

Overview

Datasets

An open benchmark

Evaluation criteria

Challenge rounds

Prizes

The Starter Kit for this challenge is available at : <https://github.com/Alcrowd/food-recognition-challenge-starter-kit>

## Overview

Recognizing food from images is an extremely useful tool for a variety of use cases. In particular, it would allow people to track their food intake by simply taking a picture of what they consume. Food tracking can be of

- 1 Authorship/Co-Authorship
- Misc Prizes : Various Prizes

A benchmark for image-based food recognition



By Seerave Foundation

7049

229

356

19

Follow

Overview **Leaderboard** Discussion Resources Submissions

Participate

Round 1

Round 2

Δ	#	Participants	Media	Average Precision	Average Recall	Entries	Last Submission	
▲	01	  rssfete	-	<b>0.573</b>	<b>0.831</b>	127	Sun, 29 Dec 2019 21:44	<a href="#">View</a>
▼	02	 kay	-	<b>0.565</b>	<b>0.759</b>	57	Mon, 30 Dec 2019 14:56	<a href="#">View</a>
▲	03	 joao_schapke	-	<b>0.537</b>	<b>0.840</b>	9	Sat, 28 Dec 2019 19:59	<a href="#">View</a>
▼	04	 nikhil_rayaprolu	-	<b>0.526</b>	<b>0.729</b>	31	Sat, 21 Dec 2019 15:43	<a href="#">View</a>
●	05	 HarryWalters	-	<b>0.526</b>	<b>0.729</b>	20	Mon, 30 Dec 2019 12:57	<a href="#">View</a>
●	06	 kunal_arora	-	<b>0.182</b>	<b>0.211</b>	9	Sat, 28 Dec 2019 21:05	<a href="#">View</a>



**Non-Annotated data**



**Non-Annotated data**



**ML algorithm**



**Non-Annotated data**



**ML algorithm**



**Human verification / annotation**



**Non-Annotated data**



**ML algorithm**



**Human verification / annotation**





**Non-Annotated data**



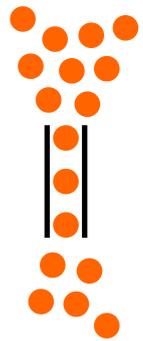
**ML algorithm**



**Human verification / annotation**



**Annotated data**





**Non-Annotated data**



**ML algorithm**



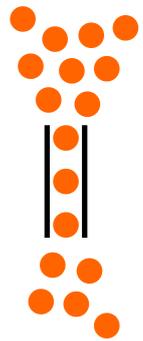
**Human verification / annotation**



**Annotated data**



**Public Benchmark**





**Non-Annotated data**



**ML algorithm**



**Human verification / annotation**



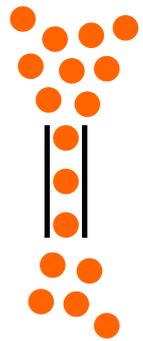
**Annotated data**



**Public Benchmark**



**Top solution(s) deployed as API**





**Non-Annotated data**



**ML algorithm**



**Human verification / annotation**



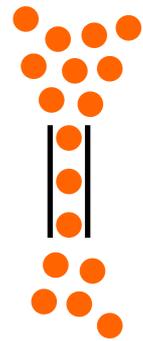
**Annotated data**



**Public Benchmark**



**Top solution(s) deployed as API**





**Non-Annotated data**



**ML algorithm**



**Human verification / annotation**



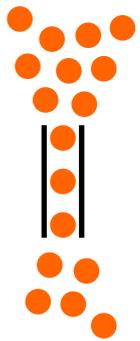
**Annotated data**



**Public Benchmark**



**Top solution(s) deployed as API**





# Up Next: Going International

With the support of a group of foundations, we plan to establish MyFoodRepo as an open, transparent standard for food tracking.



[www.aifornutrition.org](http://www.aifornutrition.org)