The Quantified Us

Andre Boorsma
My Personal Health Portal

- Cholesterol slightly elevated
- Weight -OK!
- Blood Pressure OK!
- Activity OK!
- Calorie intake- OK!
- 27.6% change
To develop T2D

Results of an Oral Glucose Tolerance Test

- Metabolomics results from dried blood spots

The metabolomics results are ready!
Weight measured by a smart scale

![Graph showing weight measurements over time, indicating a downward trend.](image-url)
FitBit measuring daily floors

M.I.A.

House with stairs

House on groundfloor

holidays

holidays
Measuring sleep!

Asleep at 1:08a Thursday for 5 hr 49 min

- Sleep Score: 68%
- Toss & Turn: 25 times
- Interruptions: 1 time

REM Mind Refresh
- Light
- Deep Body Refresh

Interruptions
Toss & Turn

1:30a 2:00a 2:30a 3:00a 3:30a 4:00a 4:30a 5:00a 5:30a 6:00a 6:30a 7:00a

REM: 29% 1 hr 40 min
Light: 49% 2 hr 51 min
Deep: 22% 1 hr 18 min
Unknown: 0% 0 hr 0 min
Risk of develop Type 2 Diabetes during my lifetime (based on the 23&Me SNP profile)

Marker Effects

Andre Boorsma
27.6 out of 100
men of European ethnicity who share Andre Boorsma’s genotype will develop Type 2 Diabetes between the ages of 20 and 79.

Average
25.7 out of 100
men of European ethnicity will develop Type 2 Diabetes between the ages of 20 and 79.
Measuring total cholesterol

Started to eat less fatty cheese

Stopped here
Quantified Self

+ 

Citizens scientists

= 

Nutritional Researcher Cohort
Nutritional Researcher Cohort

The WiFi Body Scale

Lipid-panel
47 measurements in the last 6 months:
Add more or import
Cholesterol (total)
6.08 mmol/l

Weight
Weighting username: André Boorsma
Update

Blood pressure
No blood pressure measurements in the last 6 months.

Antropometrics
144 measurements in the last 6 months.

OGTT
4 series with 27 measurements in the last 6 months.

Activity
Activity username: André Boorsma
Update

Fatsecret
Authorized with fatsecret.

Genetics
600612 SNPs have been imported.

Clinical Chemistry
45 measurements in the last 6 months.

CRP
2 mg/L

Miscellaneous
3 measurements in the last 6 months.

metabolomics

Food Intake

2401 kcal

2376 kcal

O.G.T.T.
Metabolomics: higher levels of C14:2 and C18:1 (IGT)

Serum Levels of Acylcarnitines Are Altered in Prediabetic Conditions

Manuel Mai\textsuperscript{1*}, Anke Tönjes\textsuperscript{1}, Peter Kovacs\textsuperscript{2}, Michael Stumvoll\textsuperscript{1,2}, Georg Martin Fiedler\textsuperscript{3}, Alexander Benedikt Leichtle\textsuperscript{3}
Oral Glucose Tolerance Results - IGT!

- Fasting glucose is normal
- 2 hour glucose points to Impaired Glucose Tolerance!
- Pre-diabetic?
Personalized diagnose: Oral Glucose Tolerance Test 2.0

- **Muscle**
  - Insulin Resistance

- **Blood**
  - Glucotoxicity
  - Postprandial hyperglycemia

- **Adipose tissue**
  - Lipotoxicity
  - NEFA
  - Insulin Resistance
  - Fat mass

- **OGTT**
  - Glucose, insulin, C-peptide;
  - NEFA, incretins, body composition, TG

- **Inflammation**
  - chronic low-grade inflammation
  - Endothelial flexibility/integrity

- **Gut**
  - Incretins
  - Host-microbe interaction

- **Pancreas**
  - $\beta$-cell
  - $\alpha$-cell

- **Liver**
  - Insulin Resistance
  - Gluconeogenesis
  - Fatty liver
  - Ketogenesis
**Aim:**
reduce diabetes incidence and complications

**Approach:**
treat newly diagnosed diabetes type 2 with targeted lifestyle changes

**Method:**
personalized diagnosis and advice
use OGTT (oral glucose tolerance test) to stratify

---

**Diabetes type 2**

- **Moderate β cel function**
  - 1. Liver IR
  - VLCD
  - Power / endurance training

- **Muscle IR**
  - 2. Muscle IR
  - VLCD/Power – endurance training

- **Liver & Muscle IR**
  - 3. Liver & Muscle IR
  - VLCD/Power – endurance training

- **Poor β cel function**
  - Back to GP
NRC will adapt Personalised Food Advice

324 possible personalised nutritional advices
Integration of Health Projection in NRC

Personalized model & status

Simulation / optimization / prediction

Lifestyle/dietary/medical intervention

Expected improvement

1 year

Liver metabolic balance
Muscle metabolic balance
Adipose tissue metabolic balance
Gut balance
Inflammatory balance
Vascular balance
Balanced scorecard
Balanced scorecard

Expected improvement
My Personal Health Advice

- **Weight**: OK!
- **Activity**: OK!
- **Calorie intake**: OK!
- **Blood Pressure**: OK!
- **Cholesterol**: Slightly elevated
- **Blood Pressure**: OK!
- **CRP**: OK!
- **27.6% change**: To develop T2D

O.G. T. T. – IGT! Based on your Health projection: personalised food and lifestyle advice

Elevated levels of C14:2 and C18:1 acylcarnetines
Future of Nutritional Research: A/B testing of a live cohort?
Thanks:

Ben van Ommen
Ivana Bobeldijk
Suzan Wopereis
Nard Clabbers
Wilrike Pasman

@andre_boorsma
andre.boorsma@tno.nl