Digital Solutions for Personalized Nutrition

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Research | Nestlé

Department of Nutrition and Dietary Recommendations

**Nestlé.
Enhancing quality of life and
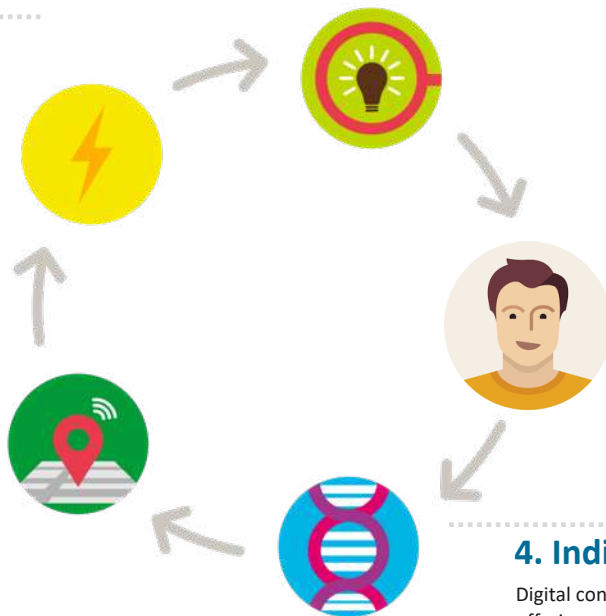contributing to a healthier future**

Macro trends – future of betterment

1. Personal responsibility (Empowerment)

Changes in benefit program design increasingly require individuals to take personal responsibility for their wellbeing. New technology, such as wearables, provides employers with opportunity to motivate and empower employees to take an active role in their own health care experience.

2. Prevention vs. treatment

The discussion of whether we should prevent future health issues or treat/manage health issues as they occur has been around for quite some time. Statistic shows that people are more likely try to find the balance between prevention and treatment – 46% globally.

3. Virtual self-advocacy

Consumers today partner with doctors instead of relying passively on them to provide treatment recommendations, and collect opinions from multiple sources including telephonic and social. VR will undoubtedly bring physical, emotional and cognitive opportunities for enhancement to these self-advocates.

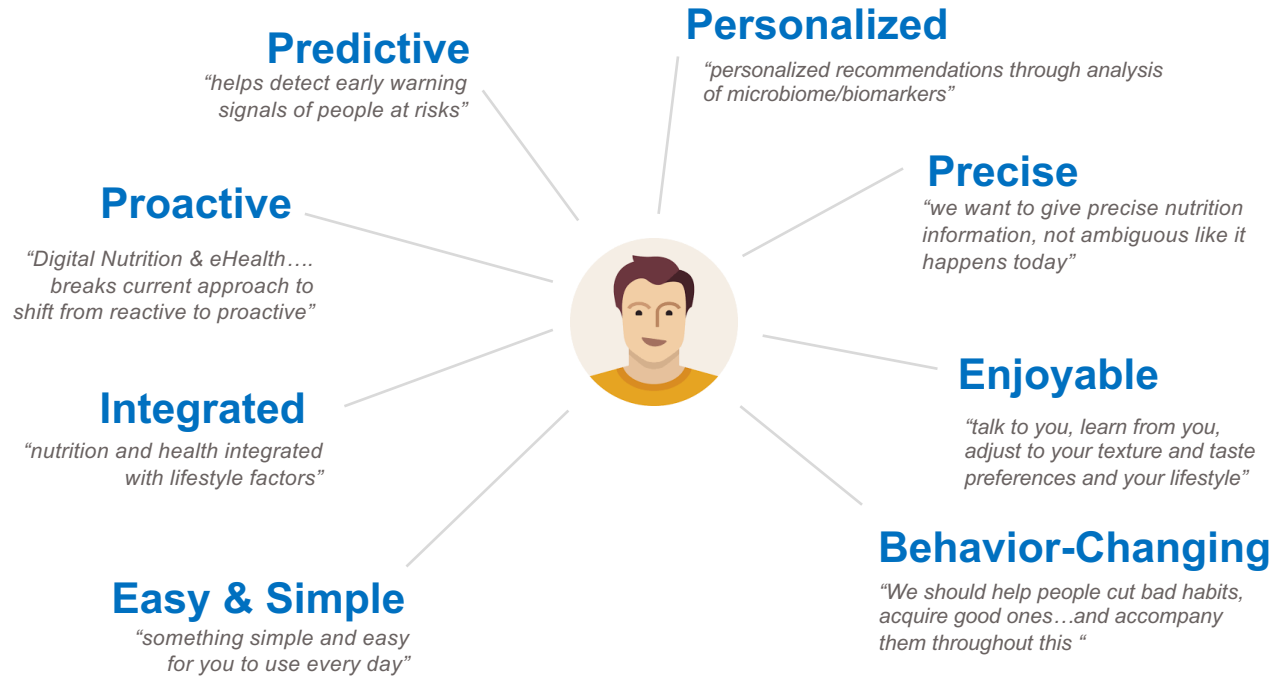## 4. Individualised, calibrated health & nutrition

Digital consumerism has heightened expectations of totally individualized offerings, and access to DNA tests is already available fueling expectations for genetic personalization.

5. Real-time feedback

Consumers experienced with both the Quantified Self movement and real-time social technologies expect digital health platforms to understand context and optimize relevance.

"Future of Betterment." Trendwatching.com. April 2016.
"Emerging Technology To Promote Wellbeing." National Business Group on Health & Xerox Human Resources Services. March 2016.
50+ Healthy Managers Global Segmentation

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Individuals want it …

Predictive

"helps detect early warning signals of people at risks"

Personalized

"personalized recommendations through analysis of microbiome/biomarkers"

Proactive

"Digital Nutrition & eHealth…. breaks current approach to shift from reactive to proactive"

Precise

"we want to give precise nutrition information, not ambiguous like it happens today"

Integrated

"nutrition and health integrated with lifestyle factors"

Enjoyable

"talk to you, learn from you, adjust to your texture and taste preferences and your lifestyle"

Easy & Simple

"something simple and easy for you to use every day"

Behavior-Changing

"We should help people cut bad habits, acquire good ones…and accompany them throughout this "

QUISPER – Personalized Nutrition Symposium

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OUR VISION

At Nestlé, we are constantly working to build, share and apply Nutrition knowledge. This is one of the many actions that we take to help fulfil our purpose :
enhancing quality of life and contributing to a healthier future.

Nestlé leverages cutting edge technology, clinically proven nutritional science to help people make smarter choices about nutrition health & wellness, delivering **HOLISTIC , PERSONAL , ACTIONABLE** recommendations in an engaging & fun experience.

Your personal nutrition health & wellness.
Your personal healthier future
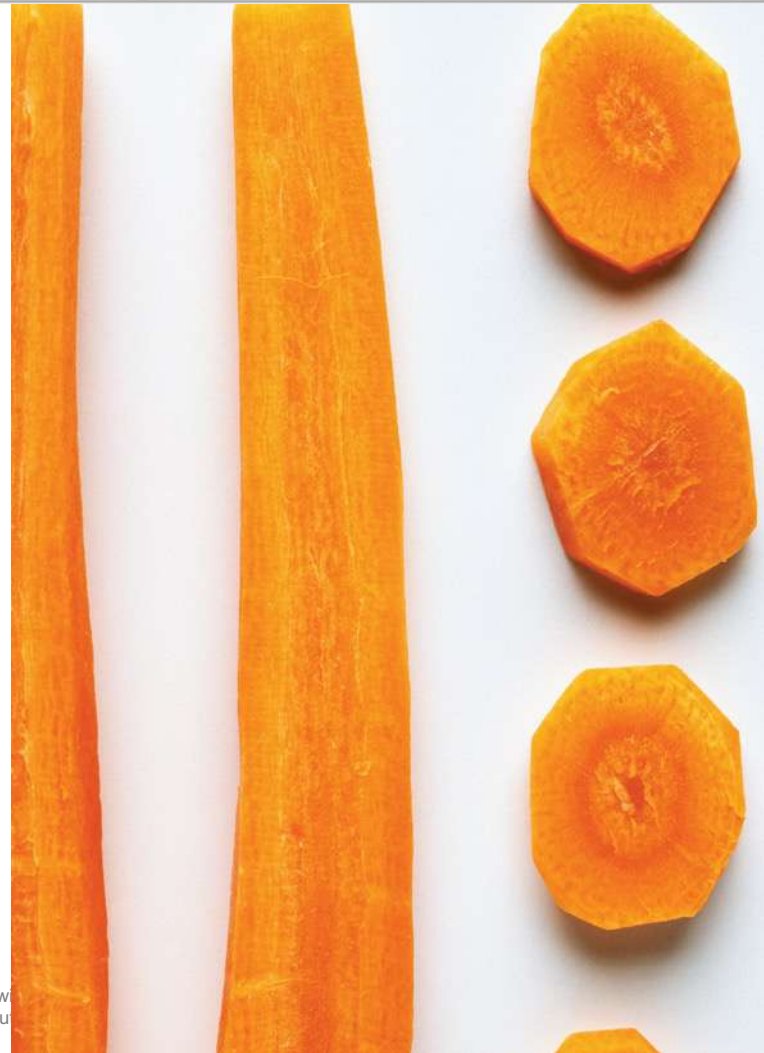
Our mission – the DNH platform

The objective is to **measure and interpret** the body's natural signals while maintaining a **complete nutritional balance,** making healthy living easy

1 Capture nutritional intake with **ease**

2 Based on past intake and personal health goals, obtain **personalized** food, recipe, and activity recommendations that help individuals to achieve their goals

3 Get **motivated** to work on their goal on a long term basis through a reward and user behavioural framework

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Opportunities for personalisation of nutrition

Understanding Food

- Food composition
- Nutrient composition
- Food groups/patterns
- Nutrients-nutrient Interactions
- Nutrients bioavailability
- GI/GL
- Texture
- Taste

Understanding Individual

- Food preferences
- Dietary needs
- Life stage / disease specific needs
- Food-related behavior phenotype
- Physiological phenotype
- Individual biological response (genetics, epigenetics)

Understanding Environment

- Lifestyle: activities, sleep, stress
- Food availability
- Cost
- Sustainability
- Culture

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What we need in order to build Digital Nutrition and Health platform

Data sources

Digital Nutrition

User

Individual diets, preferences, conditions, lifestyle + understanding of food

Personal Biology

Socio-economics

Food composition
Nutrient composition
Texture
Taste

Lifestyle

Diet

Digital health profile

- Stratification
- Scoring
- Predictive algorithms
- Recommendations

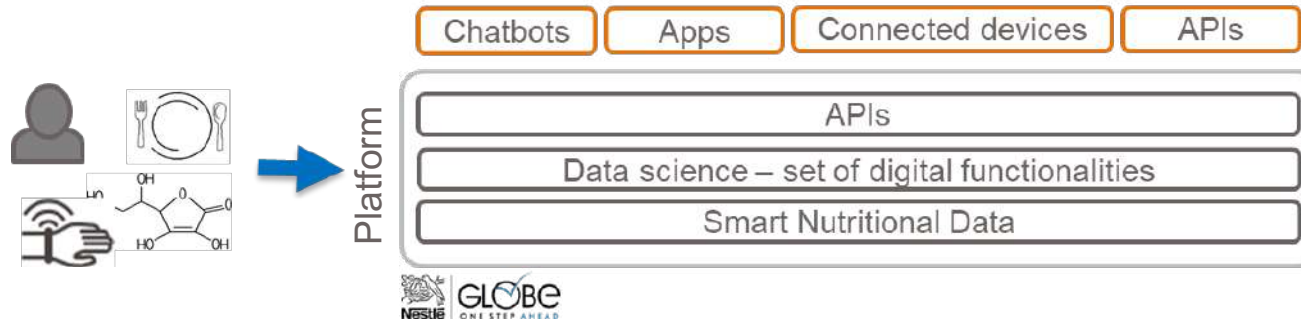Consumers or Clinical Participants

Guidance

Population

Output: Targeted & personalized nutrition products, dietary plans & digital services tailored by age/ population/ culture & preferences/ health & social-economic status

Connecting to consumers through partnerships

Nutrition and Health "Brain"

- Algorithmic quantification of nutrition, health and lifestyle
- Science development, based on Nestlé food-nutrition Know-How

User Interface

- App linked to wearables, smart home appliances, etc.
- Personalised assessment and recommendations
- Partnerships

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Personalised Nutrition and Health ecosystem

Nutrition science and food **algorithms** that decompose what we eat in nutrients and assess the quality of our diet.

Comprehensive non-intrusive **nutritional and health measuring devices** that assesses skin temperature, sleep, stress, heartbeat, etc. collecting basic body signals.

Contextual information about nutrition, eating patterns, dietary preferences and lifestyle.

Finally, **personalized recommendations** in different shapes and forms to make the users' journey a discovery experience.

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Our meal and diet scores

Meal Score

Meal · Nutrient profile

Diet Score

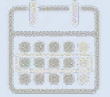Personal profile · 24h diet · Nutrient profile

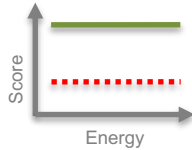## Menu plan generator

Personal profile · Personal preferences · Weekly menu plan

Proprietary algorithms

Meal Score
- 16 nutrients
- Score distinguishes healthy vs. unhealthy
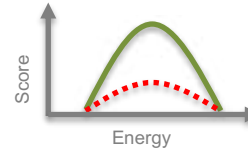- No energy recommendation

Score / Energy

High scores = Healthy balanced meal

Diet Score
- 16 nutrients
- Score distinguishes healthy vs. unhealthy
- Energy adjustment

Score / Energy

High scores = Balanced diet for metabolic health

Menu plan generator
- Automated engine
- Can adapt to health recommendations
- Specific health conditions: Crohn's, hyperlipidemia, ketogenic diet
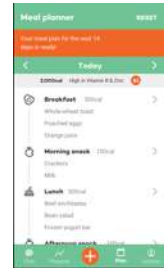
Result = Weekly healthy and balanced diet

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Meal score

Description	Allows to evaluate how close is a meal to the ideal balanced meal, based on healthy ranges of food groups and nutrients of concern

Examples

Main dish recipe
47

Recipe with unhealthy side dish
↓ **34**

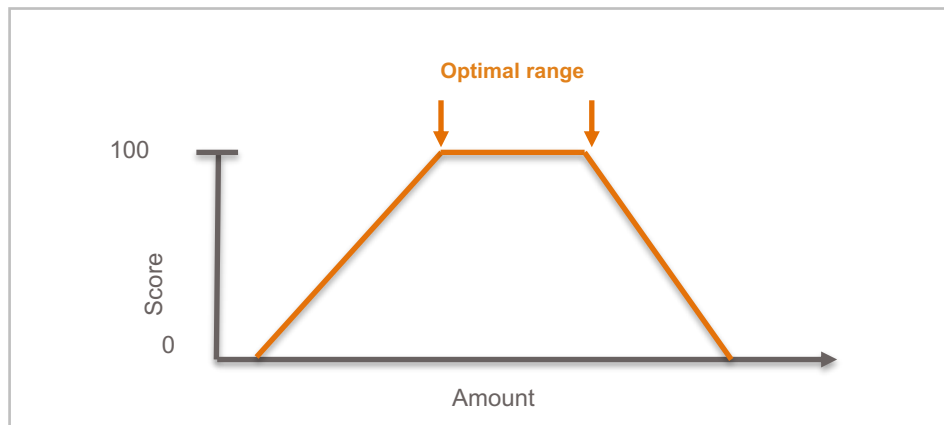Recipe with a healthy side dish
↑ **62** ↑ **58**

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Lifestyle algorithm

Our algorithm is based on the concept of **optimal ranges** and lifestyle balance

Competitive advantage

✓ **Patent application published** – Nutrition Health Score optimizing energy calculation

✓ **Nestlé's Nutrition Algorithm** recognized amongst the scientific community:

- Abstract on the nutrition algorithm on which the MNS is presented at the European Congress on Obesity

- Scientific Paper on Nestlé's Nutrition Algorithm published (*Nutrients* doi: 10.3390 / nu11020379).

- Competitive benchmark of dietary score against most downloaded apps showed higher differentiation of healthier vs. non healthier diets.

Nestlé Yiyang-Xiaomi
Nutrition Health Platform

Nestlé Yiyang-Xiaomi

Background

New retail

China is the world's largest e-commerce market

Mobile payment accounts for 70% of e-commerce

Xiaomi

Xiaomi could be valued up to $100 billion for IPO in 2018

A structure opportunity

Nestlé' leading nutrition research in China & the world with Xiaomi's connected device system linked to MIUI 9 (50mio smart phone upgraded up to Jan. 2018)

Approach

- Nutrition assessment & recommendation: dietary pattern scoring algorithm based on relative risk
- Lifestyle tracking through Xiaomi connected devices including smartphone, wearables & other smart devices
- Combined with lifestyle coaching including exercise video, health information, brain health game
- Fully aligned with health benefits of Yiyang product portfolio

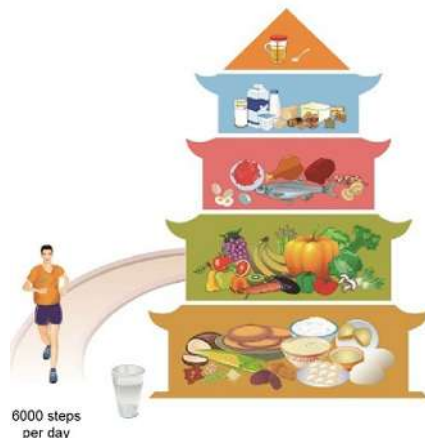# Nutritional and Health assessment

- Assessment based on all available inputs

- Daily/weekly reports

- Status in health related groups

Recommendations

- Based on Chinese dietary guidelines

- Related lifestyle content

  - Soon

    - Goal oriented
    - Fully personalized

Chinese dietary pagoda

«*Let thy food be thy medicine and thy medicine be thy food*»

Hippocrates (460-370 BC)

Thank you !

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