

# PLATIN - A Fully Automated Nutrition Monitoring Technology

For Hospitals and Care Facilities Relying on Vision-Based Artificial Intelligence Meal Analyses to Yield Nutrition and Consumption Big Data for Health Care Administrators, Logisticians and Nutritionists



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**Context**

**Neglected nutrition is a cost driver in a hospitals and for health systems - and detrimental to patient well-being**

- Too much of the food served in hospitals is wasted.
- Undetected and untreated malnourished patients cause extra costs.
- Only staff-based, labour-intensive nutrition evaluation exists in hospitals.
- Nutritional information in patient EMR generally lacking.

- > Economic and environmental costs of over-purchasing, over-producing and over-discharging.
- > Economic losses due to complications and prolonged hospital stays.
- > Deficient patient nutrition impacts patient 's well-being and satisfaction.

**Methods**

**Concept:**

- Photo of a meal **PRE and AFTER consumption.**
- Artificial intelligence (AI) to identify and quantify food.

**Realisation:**

- One camera at the end of a hospital kitchen preparation line.
- and one camera at the beginning of the return line.

**Tray tracing:**

- Patient ID in QR code on paper slip linked to:
- Tray ID encoded in a QR sticker.
- Correlation tray-patient enabled.

**Privacy protection:**

- Prior to image storage all human readable patient information is obfuscated.
- Patient data are kept within hospital.



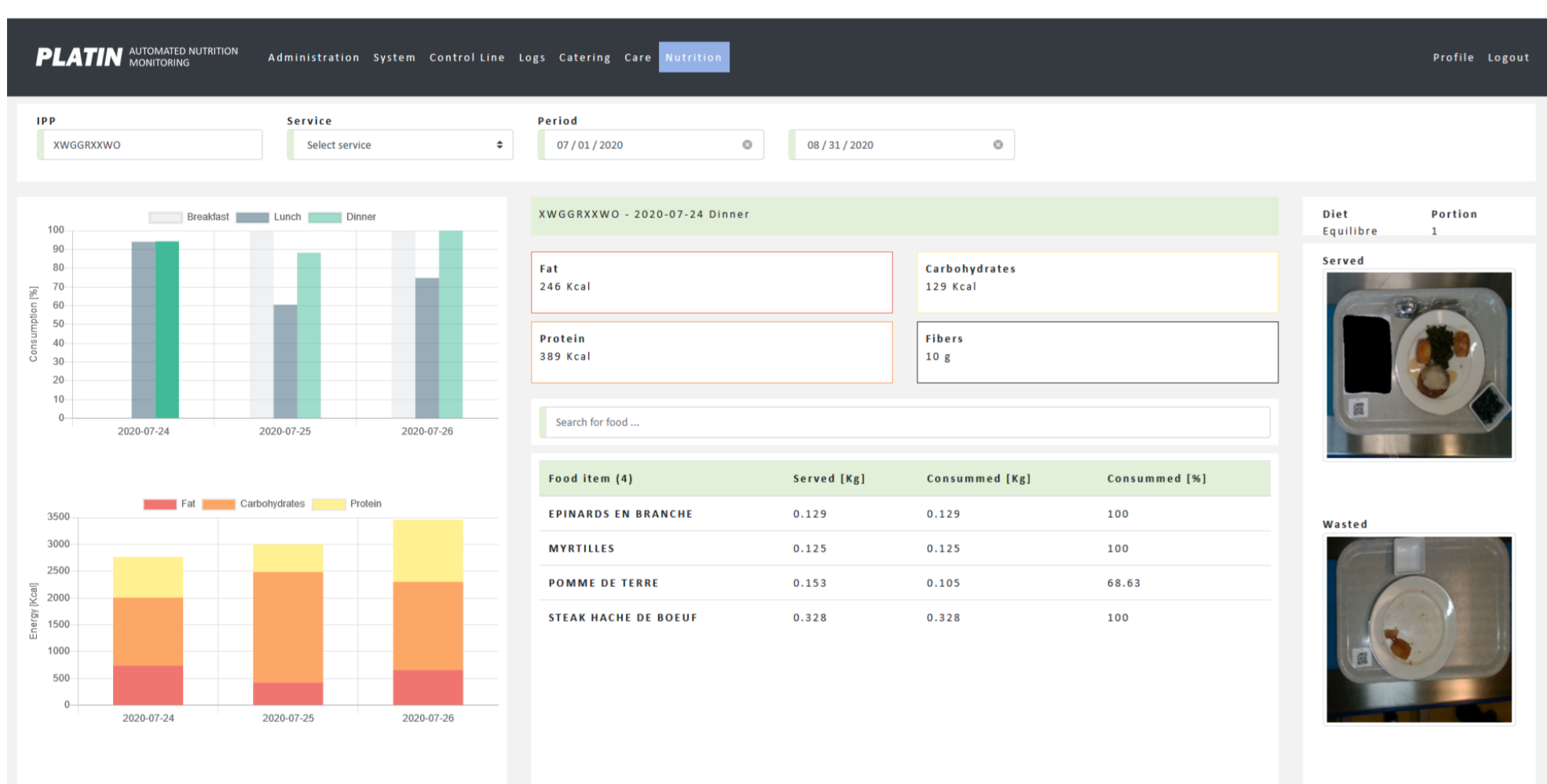



## Results and discussion

### CASE STUDY: Hospital kitchen trial – one week study monitoring EVERY outgoing and returned meal

August 2020 – one entire week in a secondary kitchen – no modification to hospital routine – >90% of all meals analysed – 862 meals, 452 patients

Creation and optimisation of different user interfaces (dashboards) to represent the gathered data to the different hospital professions:

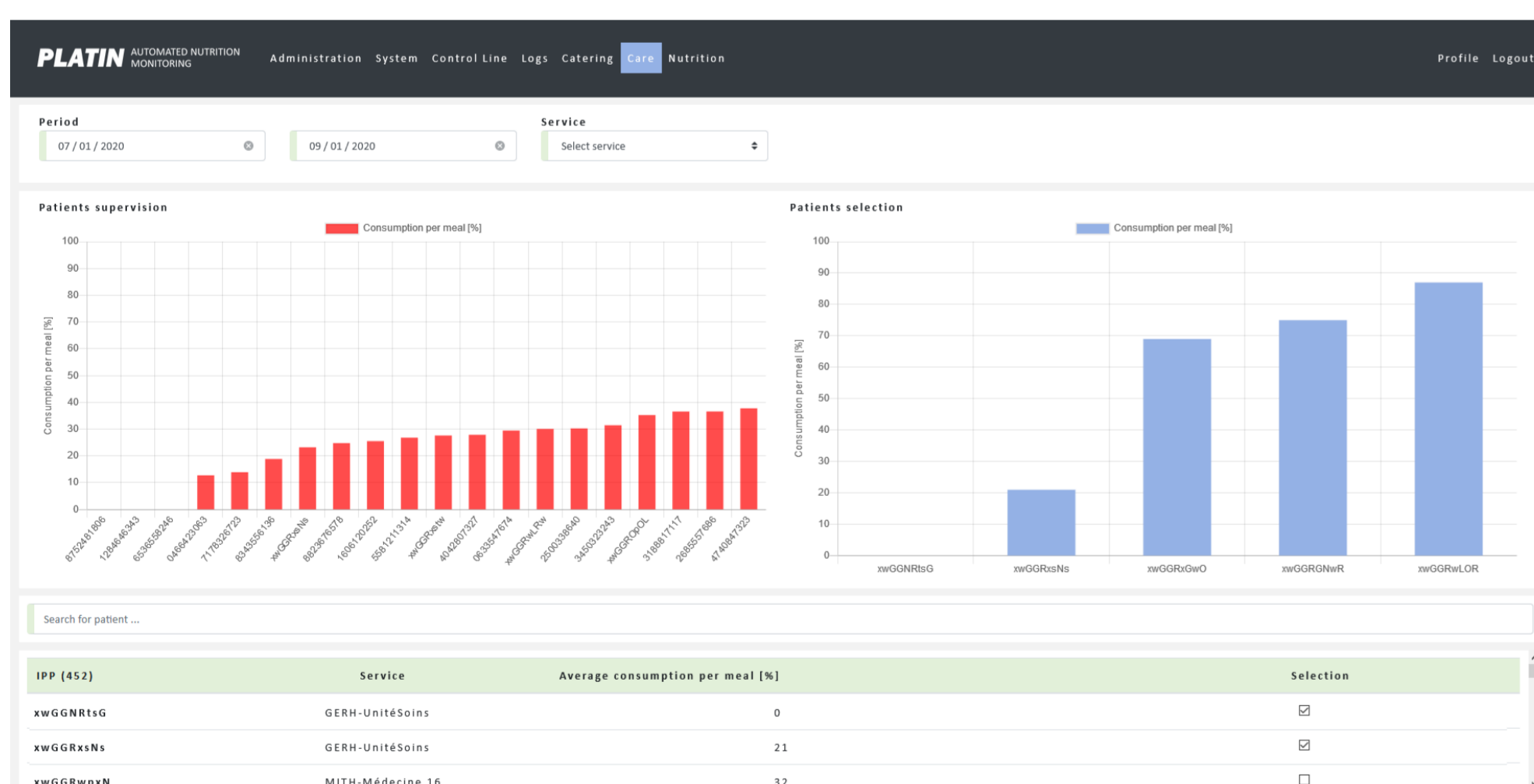


#### Dashboard 1 for Care and Medical professionals

Example. Functionality “Patient nutritional analysis”.

**Individual patient survey**, one patient can be selected from the patient list, the nutrition analysis for a single meal, a single day or a longer period is presented. All the consumed food items are listed, the nutritional values are calculated. Photos pre/after consumption of all meals are accessible through the dashboard.

Left dashboard: Nutritional analysis of a single day of one patient (all three meals). Photo of lunch pre/after consumption selected on the right hand side.

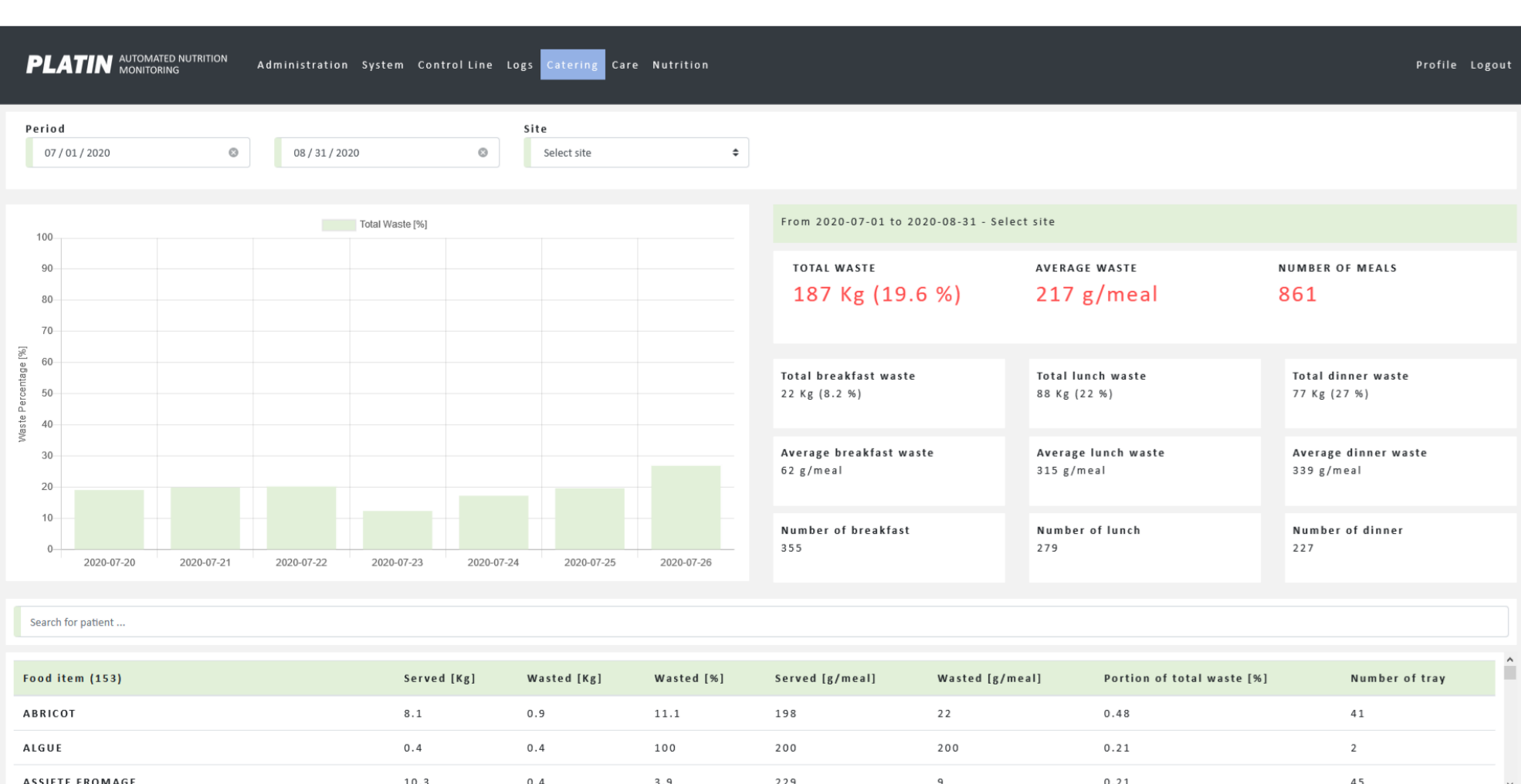


#### Dashboard 2 for Care and Medical professionals

Example. Functionality “Selection of patients”.

The user can **group different patients**. E.g. pre-defined “at risk” patients can be followed in one quick glimpse. Patients of different medical conditions, of different age groups can be grouped and compared. Patients of different wards, served by different kitchens, served with different food can be analysed together.

Left dashboard: “Risk” patient selection with lowest food uptake during one particular day. One click on the patient ID allows accessing the patient’s nutritional details as exemplified in “dashboard 1”.



#### Dashboard for Kitchen and Logistics professionals

Example. “Food waste analysis”.

The user can analyse **quantities of returned food (waste)**, a selection of groups of patients, of different hospital sections or wards, of the different meals, of individual food items, over selectable periods of time.

Left dashboard: Global picture of **returned food of one week** with breakdown into the different meals, the numbers of meals served and providing the information on the return levels for all served food items in the selected period.

### Recognised benefits of PLATIN:

#### POTENTIAL SAVINGS OUTWEIGH THE INVESTMENT IN PLATIN

- o short ROI times.

#### REAL-TIME CONTROL FOR ZERO ERRORS MEAL PREPARATION

- o Prevention of errors (according to religion, allergies, intolerances, drug interactions, etc. ...).
- o Controls matching between ordered and prepared menu (quality and quantity, etc.).
- o Cancellation, or redirection of tray to another patient.

#### FOOD WASTE ANALYSIS

- o Cost reductions of food waste reduction by adapting served portions’ quantity and composition.
- o Optimisation of menu composition to adapt to different patient preferences.

#### INDIVIDUAL PATIENT NUTRITION MONITORING

- o Cost savings through early malnutrition detection.
- o Optimisation tool: personalised nutrition.

#### CORRELATING HOSPITAL STAYS WITH NUTRITION PATTERNS

- o Big data analysis opportunities for researchers.

#### TRACEABILITY & DIGITISATION OF NUTRITION (EHEALTH 4.0)

- o Complaint handling from patients or families.
- o Complementing the Electronic Medical Record (EMR).

**Outlook**

Future studies to quantify the **improved social, economic and environmental impact** of PLATIN’s of hospitals.  
 Future studies to **correlate nutritional and medical status** of patients (incl. big data approaches).

**We are looking for partner hospitals in different European countries, contact us.**