

SATIN – SATiety INnovation

Satiety Control through Food Structures made by Novel Processing

New approaches to tackle obesity



Introduction

SATiety INnovation is a 5-year EU funded FP7 project designed to develop new food products, by using innovative processing techniques to modify food structure, to control satiety and satiation. A clinical trial will evaluate whether a satiety based

approach, using a variety of foods with enhanced satiating properties, is a viable weight management tool. The team involves seven Small- and Medium-Sized companies (SMEs), four large-industry and seven academic partners.

Objectives

- ① To develop food products that help regulate food intake by accelerating satiation during a meal, enhancing satiety and reducing appetite.
- ② To use novel processing methods and guarantee food safety.
- ③ To prove efficiency in human trials against biomarkers of satiety and / or appetite.
- ④ To measure the effect on nutrient availability.
- ⑤ To establish a multidisciplinary collaboration in food processing, nutrition and consumer science with food producing enterprises.
- ⑥ To produce and help commercialise finished products whose biomarkers of appetite and nutrient bioavailability will be characterised.

Phase 1 – Achievements

SATIN FOODS

A range of new food products with optimised structures and active ingredients targeting satiation and satiety were developed by SATIN industry & SME partners. If proven effective, European consumers will be able to buy SATIN Foods in supermarkets in the near future.

VALIDATED IN VITRO PLATFORM

A validated *in vitro* platform for high throughput analysis was developed to identify potential satiety effects of bioactive foods and food components and is now available to interested parties. Based on the resulting product profiles, six SATIN foods were selected to move on to mid- and long-term clinical trials.

SHORT-TERM TRIALS

Selected active ingredients included in foods were tested in order to assess their effects on gut microbiota, nutrient bioavailability and biomarkers of satiety and to validate the SATIN *in vitro* platform.

WORK PACKAGE RESULTS

WP1 Selection of food components & in vitro screening

- The assays comprising the *in vitro* platform were used to test: pure ingredients, digested ingredients and matrices processed through SHIME experiments.
- For each assay, parameters suitable to define their potential beneficial effects on satiety were established.
- Based on these parameters, six prototypes of new food formulations were chosen for *in vivo* studies.

Conclusions:

- The results obtained from the different assays were combined to draw a ranking of prototypes, based on their potential beneficial effects on satiety.
- Based on that ranking, six prototypes were selected for further *in vivo* studies.

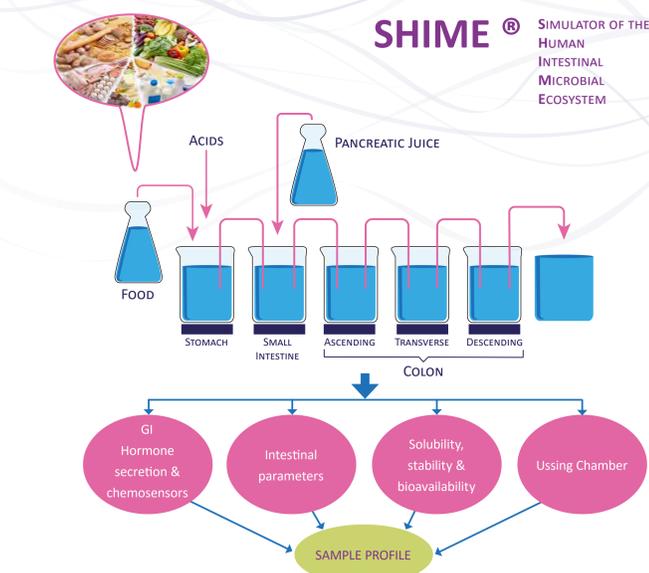
WP2 Sensory factors & food structures in satiation & satiety

- Dairy products, fruit juices and nectars, meat and fish products, and breads were optimized in food structure and combined with (active) ingredients with evidence to support their potential to accelerate satiation and/or enhance satiety.
- After screening for flavour release during actual consumption and texture building under gastric conditions the six most promising products were selected for Phase 2.

Conclusions:

- 80 food prototypes were developed serving different product categories and eating occasions.
- Efficacy testing of six products in human intervention studies is ongoing.

6 Products:



WP3 Microbiota, gut function & biomarkers of appetite & related health

Two short-term studies, with approx. 20 human volunteers in each, examined selected active ingredients:

- Study 1 - weight maintenance diets: Resistant starch 'Actistar RS type 3' 1) influenced composition of gut microbiota and 2) significantly reduced fasted blood glucose concentrations when compared to a weight maintenance diet.
- Study 2 - dietary intervention study: The potentially satiating ingredients 1) Beta-glucan and 2) Arabinoxylan-oli osaccharides produced distinct responses in faecal microbiota composition.

Conclusions:

- Effects of controlled diets upon microbial fermentation were consistent with findings from previous studies.
- Both studies showed the expected benefits in terms of weight loss using a controlled diet containing 30% calories from protein and 40% from carbohydrates.
- No evidence for gastrointestinal discomfort from added ingredients at the dose given.

Phase 2 – Outlook

SATIN SHORT AND MID-TERM TRIALS

SATIN academic partners examined the six foods selected from Phase 1 in gold standard *in vivo* studies of appetite control. The two best performing foods are being further examined in on-going studies of weight management. These studies will not only substantiate potential product health claim applications at the European Food Safety Authority, but also identify and characterise consumer benefits of satiety beyond weight management. For foods proving successful in these trials, targeted exploitation plans will support their progression from the lab to the European market.

SATIN LONG-TERM TRIALS

In large scale intervention studies across Europe, products provided by collaboration partners will be used to assess whether a satiety based approach is an effective weight management tool for consumers.

WORK PACKAGE RESULTS

WP4 Validation of satiating dietary components on short- and mid-term eating behaviour

Two out of six products met the criteria for submission to mid-term weight management trials.

- Two mid-term studies are underway to examine effects of SATIN products on appetite, weight management and consumer benefits during energy deficit from imposed dietary restriction or physical activity.

Conclusions:

- WP4 demonstrated beneficial effects on short-term appetite control in two out of six SATIN prototype products.
- Mid-term effects on appetite and weight management after repeated use of SATIN products in the diet will be determined.

WP5 Lasting health benefits for consumers

- A multi-centre, large-scale, long term trial is ongoing. The aim is to examine whether a diet containing food products shown to acutely reduce energy intake can have sustained effects on energy balance and body weight regulation.
- Furthermore, to inform the guidelines for health claims published by EFSA, it aims to test the hypotheses that an increase in satiety is a beneficial physiological effect.

Conclusions:

- Results from the study will be available during the latter part of 2016.

References

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