ProDigest
GASTROINTESTINAL EXPERTISE

Gastrointestinal expertise & research services

Gut research made easy

Access validated gut models to test your products faster, predict microbiome effects, and reduce clinical trial risk.

With 15+ years of expertise in digestion, the microbiome, and host–microbiome interactions, ProDigest leverages its world-class gut platforms to reveal how the microbiome shapes health.

Founded at Ghent University — a centre of scientific excellence for over 200 years — ProDigest is firmly rooted in academia and backed by 300+ publications. We partner with companies in pharma, biotech, food, functional food, pet food, and animal feed to deliver tailored gastrointestinal research that adapts to your products, goals, and pace

"Partnering with ProDigest has been instrumental in helping us understand the true impact of our ingredients on the gut microbiome. Their advanced microbiome models, combined with their expertise in the field, have provided us with reliable and actionable scientific insights that significantly supported our product research and development and reduced uncertainty—far beyond what traditional testing could offer."

Brendan J. Kesler
R&D Innovation Director, Futureceuticals

Why work with **ProDigest?**

With our *in vitro–in vivo* correlation (IVIVC) validated technology platforms, we provide actionable results that help you innovate faster, make the right choices early in the R&D process, cut development risk, and deliver evidence you can trust.

Validated *in vitro-in vivo* gut models
Mirrors and predicts what happens *in vivo*

Custom Study Design
Personalised to your project needs

Guide early-stage R&D
Predictive results enable smarter product choices and informed decision making

Deep gut and microbiome expertise
Stronger study design based on years of experience

De-risk your pipeline ethically
Reduce cost and animal use, for a cruelty free brand

Validate your final products
Strengthen outcomes and cut failure risk in human clinical trials.

Scalable to Your Needs
Built for screening through validation

Evidence You Can Trust
300+ peer-reviewed publications

Turning Data Into Direction
Get actionable insights, not just data

Why choosing the **right model matters**

There's no one-size-fits-all in gut health research. The questions are too diverse — and the science too specific — for standardised models to deliver real and predictive answers.

Every study is designed around your needs — giving you control at every step. Choose and configure the gut platform that aligns with your goals — flexible by design, translational by nature.

UpperGIT SHIME®
Advanced modelling of stomach and small intestine digestion

Colon-on-a-plate®
Fast, high-throughput screening for microbiome effects

Kinetic Colon-on-a-plate®
Dynamic, high-throughput insight into microbiome effects over time

Metakey®
Deep insights at the metabolic leve

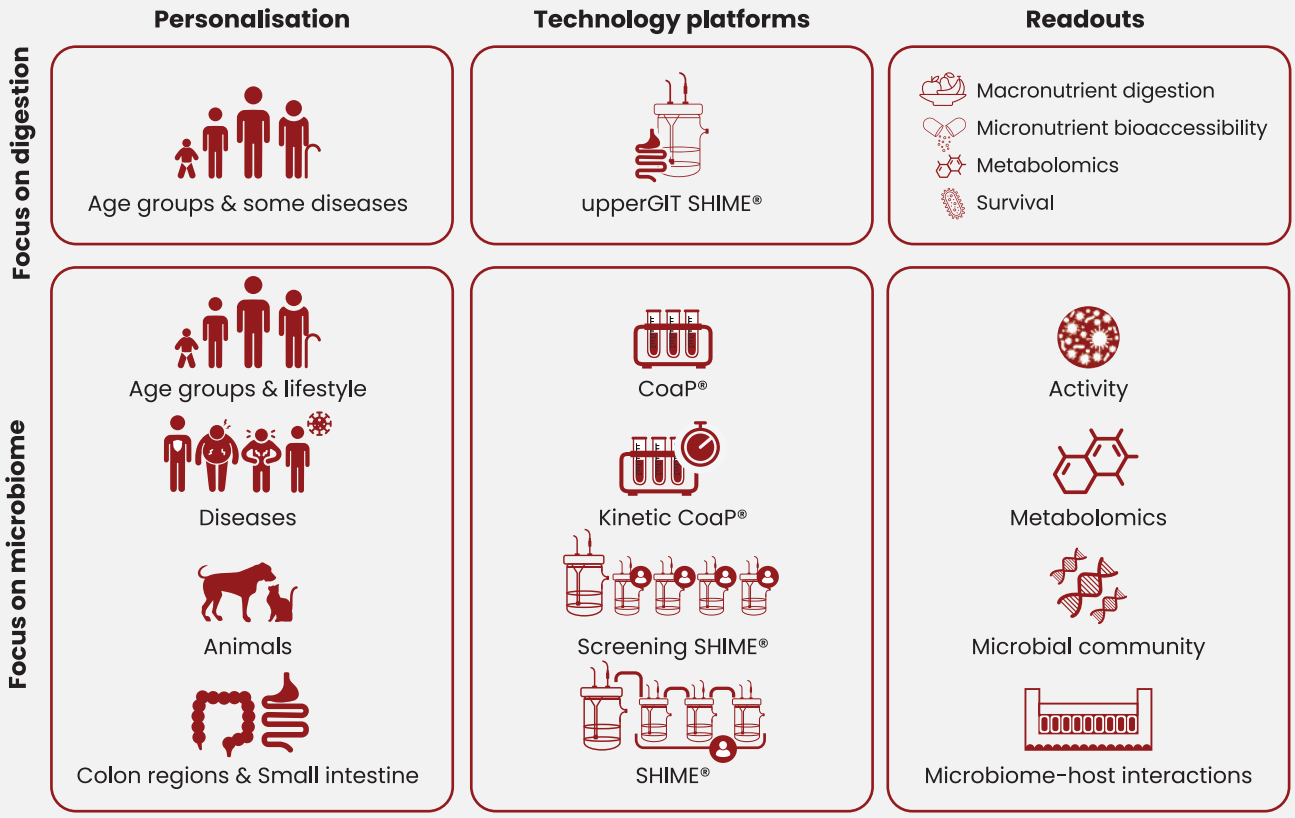
Screening SHIME®
Gut microbiome simulation that combines throughput with the impact of repeated dosing

SHIME®
The most validated, end-to-end gut microbiome simulation for long-term repeated dosing and region-specific activity

Mucosal Simulation

Go beyond luminal analysis with a mucosal compartment that shows how microbes behave at the gut interface. Track colonization, adherence, and host cross-talk — key factors often missed in standard models. Combined with upstream digestion models, mucosal simulation adds biological relevance and deeper insight into product performance and mechanisms of action.

The strength of your research begins with the right experimental design. With IVIVC-validated gut models and fully customisable study designs, ProDigest gives you the freedom to explore the mechanisms, populations, and outcomes that matter most — producing results that reliably predict *in vivo*.



With **ProDigest,** you can:

1. **Choose the right technology —** from high-throughput screening to long-term dynamic models — to match your research goals.

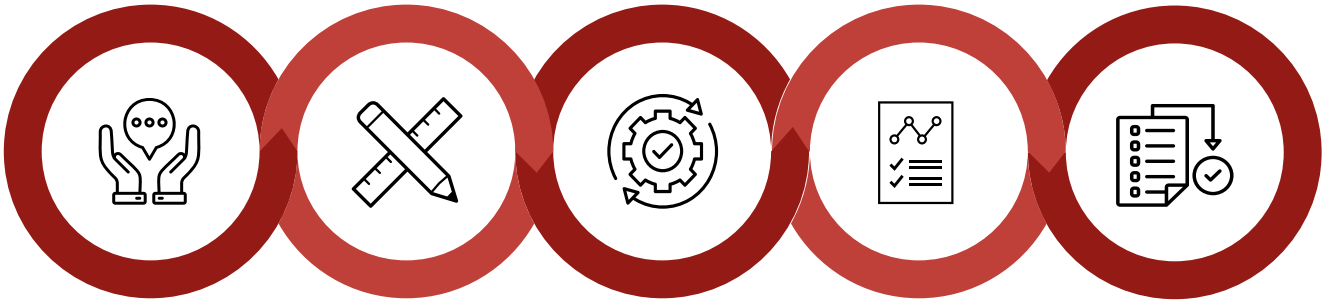
2. **Define the readouts** that reveal mechanisms, performance, and health impact.

3. **Tailor the study design to include the relevant population groups and inter individual variation —** across species, age groups, health conditions, and gut regions.

As an active biobank, we provide human and animal microbiota to ensure studies reflect real gut environments for a broad diversity, population groups and diseases. Together with our IVIVC validated models this allows to assess and compare products for target groups.

How **we work** with you

Collaboration that delivers clarity and results



Define
Set clear research goals and product questions together.

Design
Tailor the study with the right model and readouts, guided by our in-house experts.

Execute
Bring the project to life in our labs using advanced gut models and scientific expertise.

Report
Stay informed with interim updates, and receive a final in-depth report with meaningful insights.

Deliver
Turn results into action — review outcomes, discuss impact, and define next steps together.

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SHIME®-Your All-in-one Platform

Simulate full gut conditions to track microbiome shifts long-term, assess regional effects, and generate *in vivo*–predictive data to guide product development.

SHIME® is the leading *ex vivo* technology for gut microbiome research — replicating the entire GI tract with accuracy in both human and animal studies.

From early discovery to product optimisation, it delivers high-quality insights to show how your product works, uncover mechanisms, and reduce R&D risk for all types of test products.

> *"A knowledgeable and proactive partner who brought the right focus to a well-designed study."*
>
> **Elisa Arte**
> PhD, Head of Food R&D, Enifer

Why Use the **SHIME®?**

The SHIME® recreates the entire gastrointestinal tract — human or animal — in the lab. It enables detailed study of digestion, fermentation, and microbiome activity under physiologically relevant conditions, bridging the gap between *in vitro* and *in vivo* to reveal how your product truly performs inside the gut.

01

Full GI Tract Simulation

Capture activity from stomach to distal colon in full detail

02

Time-Series Microbiome Insights

Track the impact on the microbiome over days to weeks

03

Clinical Trial *In Vitro*

Replicate human study conditions in the lab

04

Validate your Product or Formulation

Build evidence to support development and launch

05

Gut Region-Specific Readouts

Target effects in the small and large intestine

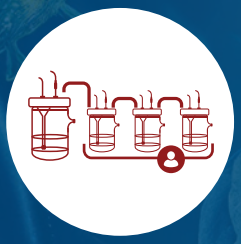
06

Luminal + Mucosal Analysis

Study both compartments in parallel

Configure the **SHIME®** to fit your needs

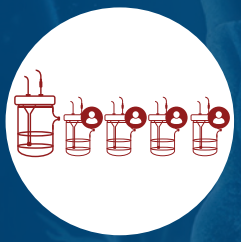
One Platform. Four Configurations: Choose the SHIME® that best fits your needs



SHIME®

The original, gold-standard model

- 3-week repeated dosing
- Full gut microbiome simulation



Screening SHIME®

High-throughput microbiome screening

- 8-day dosing
- Fast turnaround

Dysbiotic SHIME®

For IBD, IBS, diabetes and other diseases

- 8-day dosing
- Diseased and dysbiotic microbiomes

Extended SHIME®

Built for long-term studies

- 3-week dosing or longer
- ideal for multiple treatment phase studies

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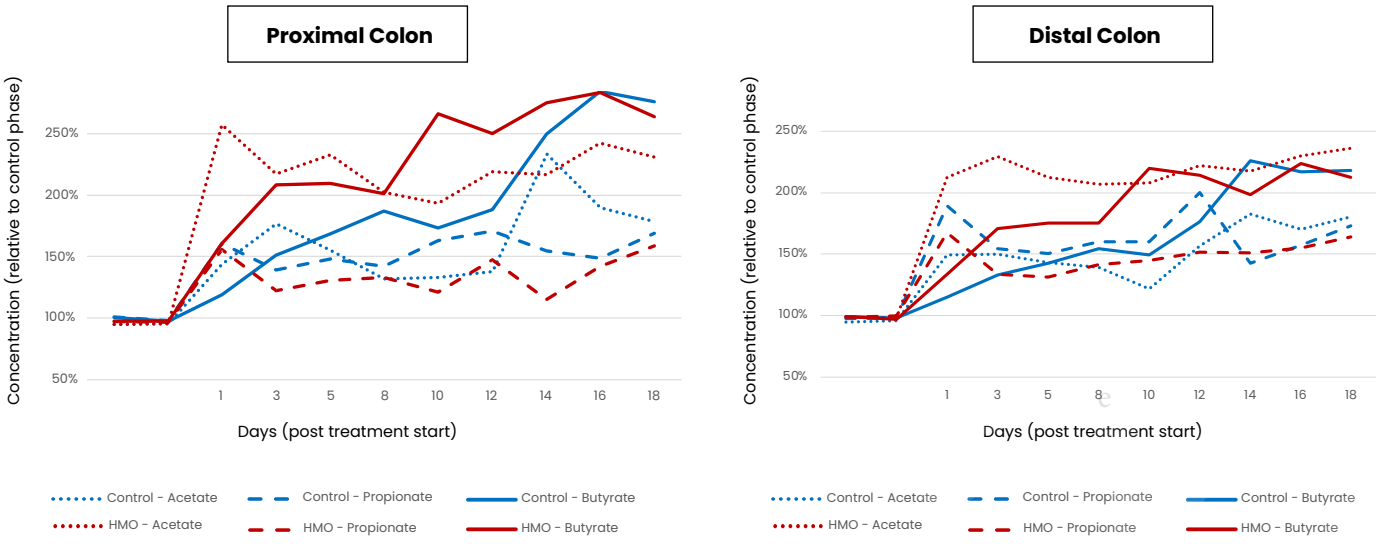
Use Case:
HMOs in Infant Nutrition

Challenge

Formula developers needed to understand how HMOs (2'FL + LNnT) affect gut health — and whether lab results match real infants.

Solution

ProDigest used the **SHIME®** seeded with infant microbiota and dosed at regular intervals to mimic natural feeding.



Results

+100%
acetate in only a couple of days → rapid fermentation

+100%
butyrate over a few weeks → lasting microbial activity

Bifidobacteria doubled (15% ~30%)
→ mirroring *in vivo* infant data

Beyond numbers, SHIME® delivers a story: how good bacteria grow, how metabolites build, and how ingredients truly make an impact — guiding developers toward smarter product decisions.

Adapted from Natividad et al. Nutrients 2022, 14(12), 2546, doi: 10.3390/nu14122546 and Berget et al. mBio 2020, 11(2), e03196, doi: 10.1128/mBio.03196-19.

Colon-on-a-plate®

Test hundreds of conditions, compare results fast, and prioritise top performers with *in vivo*–predictive data.

Colon-on-a-plate® is a fast, *ex vivo* model of the human colon that lets you study microbiome–product interactions across hundreds of conditions in under 48 hours. Built for early-stage screening, it helps you compare products quickly and prioritise the ones with the most promise.

Why Choose **Colon-on-a-plate®?**

01

Test Hundreds at Once

Evaluate multiple compounds in parallel — without compromising insights

02

Smarter, Cost-Efficient Screening

Prioritise top performers and cut time spent on weak leads

03

48-Hour Turnaround

Effects investigated over the course of 48 hours.

04

IVIVC Proven

Deliver *in vivo*–relevant, high-quality data

05

Donor-to-Donor Comparison

Uncover interindividual variation in healthy and diseased populations — and its impact on product performance

06

Comprehensive Readouts

A broad range of endpoints, delivered with consistent quality

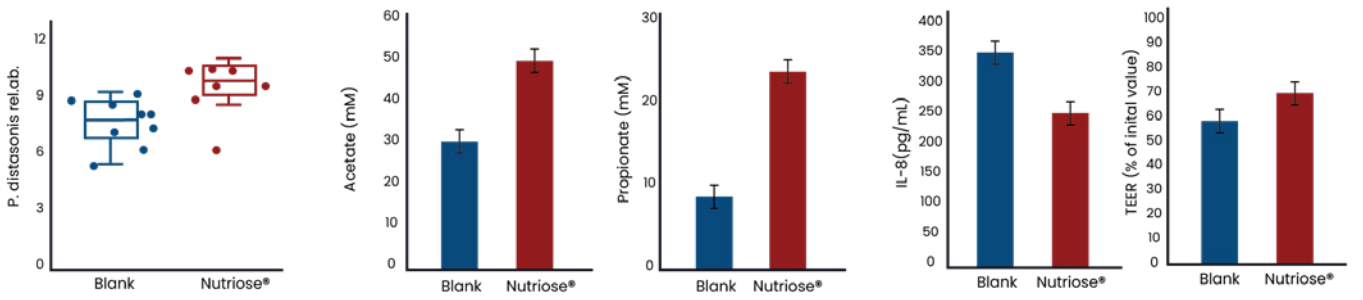
Use Case: **Nutriose®**

The predictive strength of Colon-on-a-plate® becomes clear when compared directly to in vivo outcomes - as shown in a study using NUTRIOSE®, a resistant dextrin with known prebiotic effects.

Colon-on-a-plate® - IVIV correlation

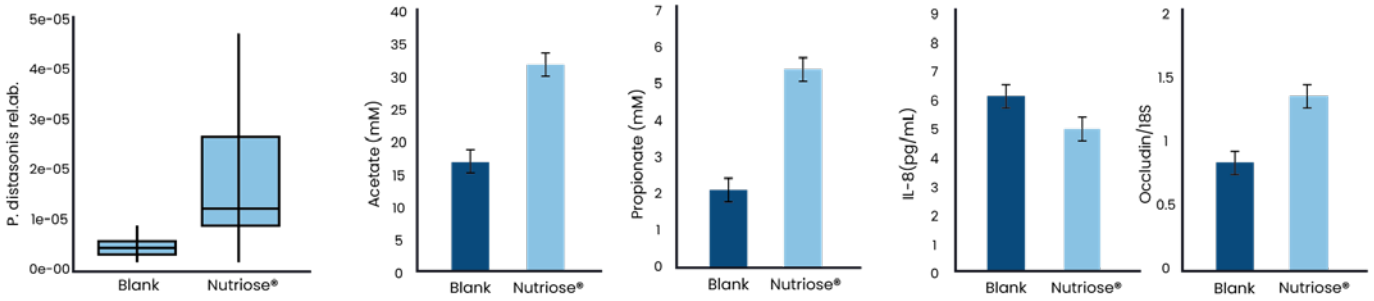
Colon-on-a-plate® *ex vivo* data

Microbiome composition | **Functionality of the microbiome** | **Immunity** | **Barrier integrity**



In vivo and clinical data

Microbiome composition | **Functionality of the microbiome** | **Immunity** | **Barrier integrity**



Kinetic Colon-on-a-plate®

Track kinetic responses to reveal microbial dynamics and mechanisms.

Kinetic Colon-on-a-plate® measures microbial and metabolic shifts at 6, 24, and 48 hours — showing both the pace and pattern of response. Its high-throughput design delivers dynamic insights across donors, ages, health profiles, and disease states while minimising sample volume and cost. This accelerates screening, helping you pinpoint top candidates early and drive development success.

Why Choose **Kinetic Colon-on-a-plate®**

Track the what, when, and how of microbiome activity — with all the advantages of Colon-on-a-plate®, plus more.

01

High-Throughput Screening

Evaluate hundreds of compounds in parallel with 48-hour readouts, capture donor-to-donor variation, and focus resources on the most promising candidates

02

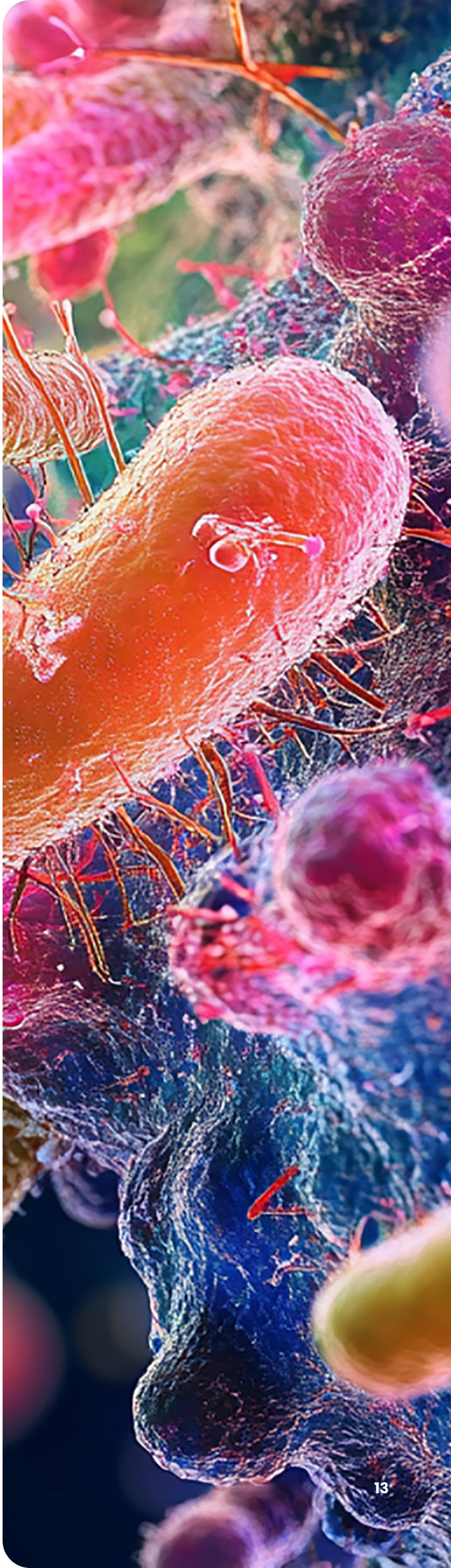
Time-Resolved Mechanistic Insights

Measure microbial and metabolic shifts at 6, 24, and 48 hours to reveal both how and when products act

03

Efficient Design

Reduce material use while expanding study scope



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Use Case:
Cross feeding Kinetics

Kinetic Colon-on-a-plate® reveals transient lactate–butyrate cross-feeding missed by endpoint-only setups. Time-resolved sampling showed lactate peaking early and converting into butyrate — a mechanistic insight undetectable at 48 hours alone.

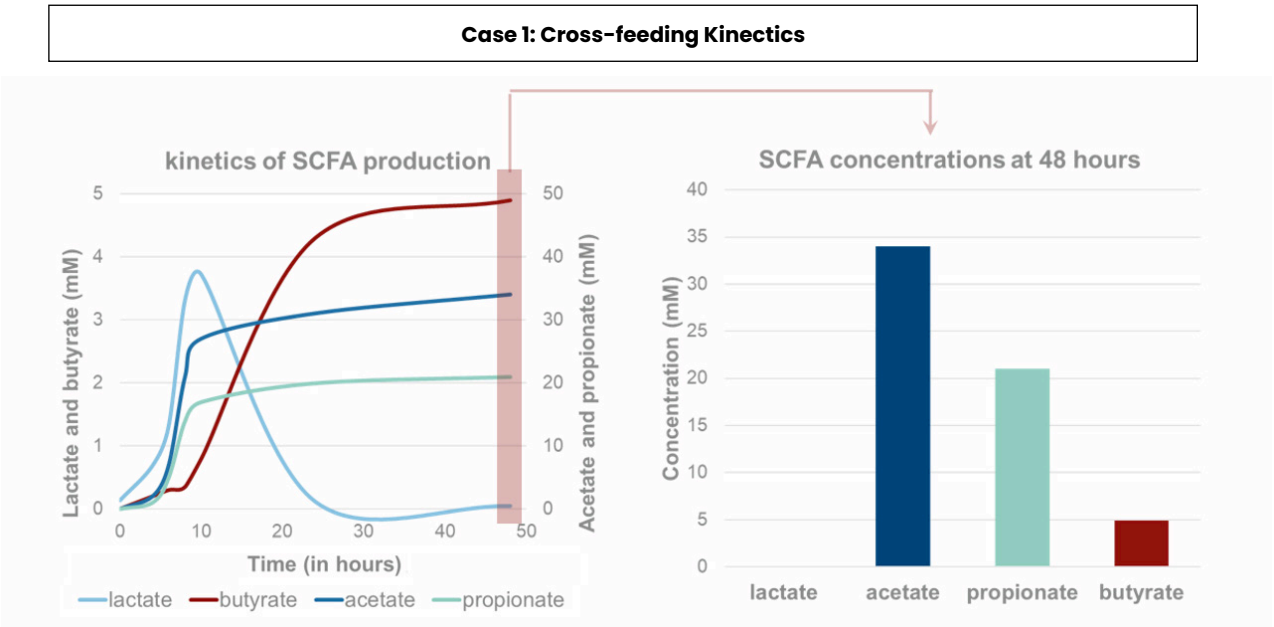
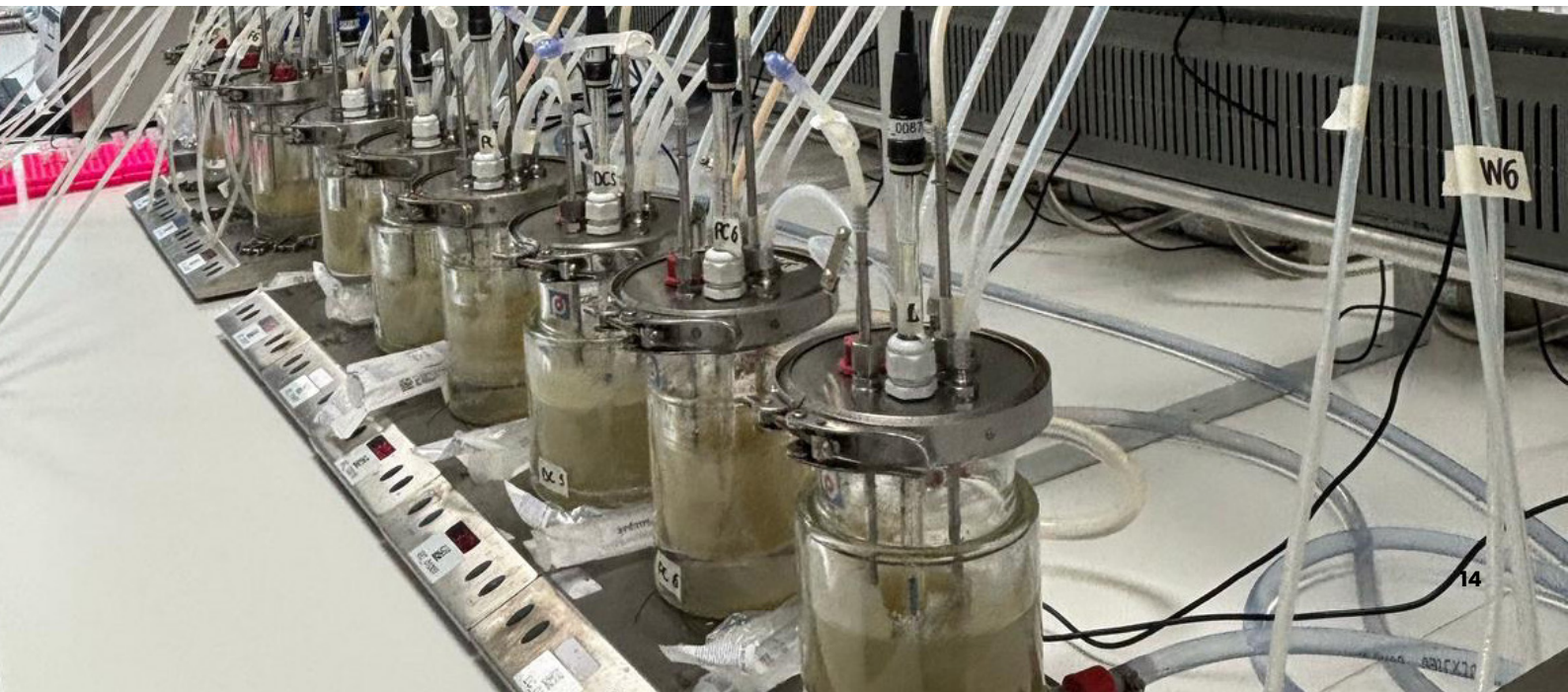


Figure 1 *A prebiotic was subjected to colonic simulation using a healthy donor microbiome. Sample were collected from a single reactor at 0, 4, 6, 8, 10, 24 and 48 hours (4, 8 and 10 hours are non-standard timepoints in the kinetic Colon-on-a-plate®) and processed to determine lactate, acetate, propionate and butyrate concentrations. Curves have been plotted to the data points.*



MetaKey®

Identify key metabolites that explain health effects beyond the gut

MetaKey® pinpoints the metabolic signals that matter. By combining rapid fingerprinting with advanced metabolomics — including our gut metabolite profile — it links microbiome activity to measurable changes in the body.

From gut models to clinical samples, MetaKey® delivers trusted data to guide R&D, strengthen product success, and support profitability. Use it alone or together with SHIME®, Colon-on-a-plate®, or Kinetic Colon-on-a-plate® to uncover functional effects and mechanisms of action.

Why Choose **MetaKey®?**

01

Two complementary technologies

LA-REIMS for fast metabolic screening
UHPLC–HRMS for high-resolution insights

02

Gut Metabolite Profile

230+ gut microbiome metabolites connected to immune, metabolic, and neuroactive pathways

03

In vitro and clinical compatibility

Compatible with blood, biofluids, fecal matter, and gut model samples

04

Flexible, scalable workflow

From large sample sets to targeted validation

05

Custom data outputs

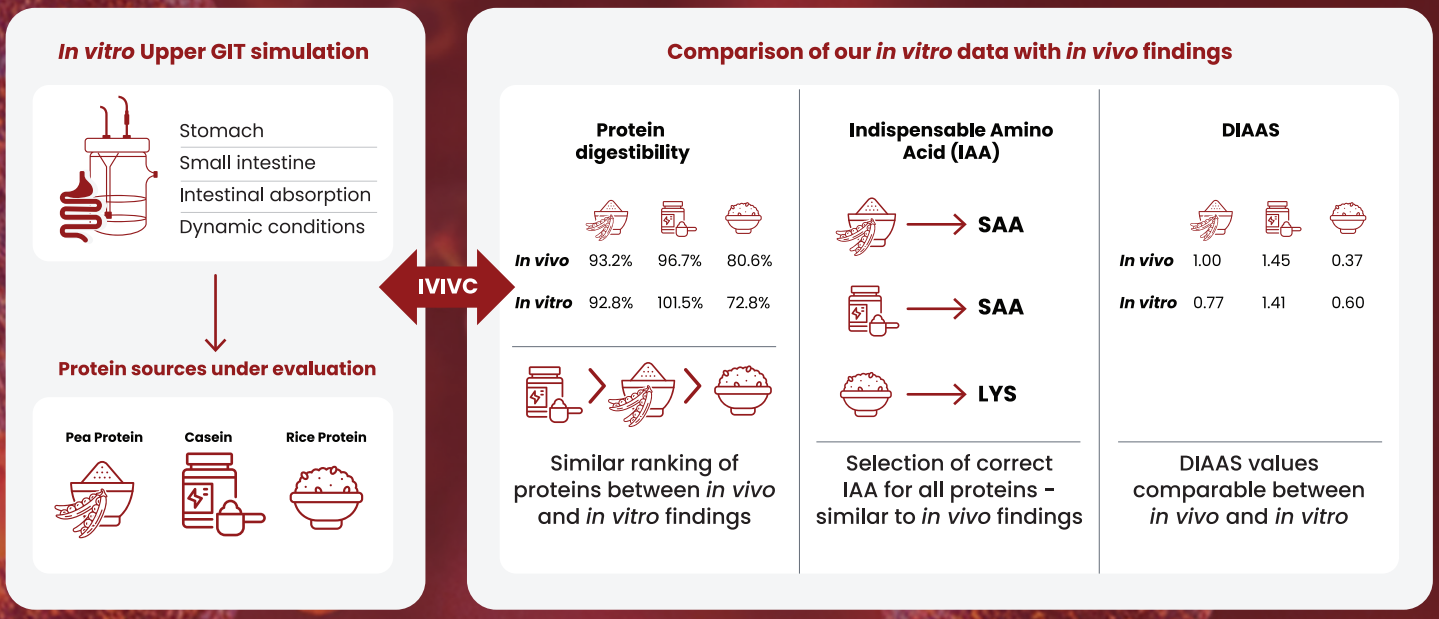
Choose raw data, stats, pathway mapping or full interpretation — whatever your team needs

UpperGIT SHIME®

See how products transform during digestion — from stomach to small intestine. The Upper GIT SHIME® recreates stomach and small intestine conditions to assess digestion, survival, bioaccessibility, formulation performance, and compound release before products reach the colon.

It captures key digestive processes — from pH shifts to enzyme activity and bile salt exposure — under fed or fasted conditions. Available in static, higher-throughput, or dynamic formats, it can be tailored to specific populations. Use it alone to study breakdown and absorption, or combine with SHIME®, Colon-on-a-plate®, or MetaKey® for full GI tract coverage.

Use Case:
Protein digestibility and DIAAS



Analytical capabilities across the board

Connect every model to the data that matters
From microbial shifts to host interactions, SHIME®, Colon-on-a-plate®, Kinetic Colon-on-a-plate®, and UpperGIT SHIME® link with advanced analytics to map your product's full journey through the gut. Track microbiome composition, fermentation, metabolite production and barrier function to bridge findings with real-world impact and move your pipeline forward faster.

Microbial Composition
- qPCR panels (incl. LBP/probiotic strain tracking)
- 16S rRNA gene profiling
- Shotgun sequencing metagenomics
- Flow cytometry

Microbiome–Host Interaction Assays
Evaluate how microbial changes impact host biology:
- Barrier integrity
- immune modulation
- Wound healing assays
- Pathogen adhesion/invasion

Microbial Fermentation Activity
- Short-chain fatty acids, branched SCFA, lactate, ammonium
- pH and gas production & composition
- Other fermentation markers available on request

Impact on Digestion
- Carbohydrate and protein breakdown
- Mineral, vitamin, micronutrient, API quantification
- Probiotic survival
- Bile salt analysis
- …and more

Metabolomics using the with MetaKey® platform
Gain functional insight into gut microbial metabolism:
- LA-REIMS for high-throughput metabolomic fingerprinting
- Gut metabolite profile
- uHPLC-HRMS for broad and targeted metabolite profiling and quantification

Want to learn more?

Let's explore how our gut models can support your next study. Whether you're screening ingredients, validating function, or bridging to clinical data — we're here to help

Get in touch:

info@prodigest.eu **www.prodigest.eu** **@ProDigest**