ProDigest
GASTROINTESTINAL EXPERTISE

SHIME®

Smarter, Faster, More Predictive Gut Modeling

Replicate the human gut under true-to-life conditions – accelerate discovery, validate products, and predict real-world outcomes.

About **ProDigest**

Founded at Ghent University, ProDigest is a global leader and preclinical research service provider in gut microbiome and digestion research. We offer the most advanced portfolio of *ex vivo* gut models — including SHIME® and Colon-on-a-plate® — to replicate human intestinal conditions with accuracy. Our solutions help companies in food, nutrition, feed, and pharma accelerate discovery, validate products, and reduce development risks.

SHIME® – The World's Most Advanced Dynamic Gut Model

The SHIME® (Simulator of the Human Intestinal Microbial Ecosystem) replicates digestion, microbiome composition, and activity across the full gastrointestinal tract — delivering accurate, reproducible, and consistent insights for researchers, innovators, and product developers.

With a track record in over 150+ peer-reviewed studies, SHIME® bridges the gap between lab testing and human trials — giving you a clear view of how your product interacts with the gut microbiome and the gut in real-life conditions improving transition of your products from pre-clinical into clinical development.

From Lab to Clinic

Proven IVIVC validation ensures SHIME® results reflect human outcomes.

> *"A knowledgeable and proactive partner who brought the right focus to a well-designed study."*

Elisa Arte
PhD, Head of Food R&D, Enifer

What the **SHIME® Delivers**

SHIME® gives you a clear view into how the gut really works — revealing microbial activity, ingredient metabolism, the impact of microbiome composition changes, and host–microbiome interactions under fully controlled, human-relevant conditions.

It turns complex processes into meaningful insight, supporting faster optimisation and stronger evidence behind your results.

01

Long-term dynamic simulation

Capture gut processes over weeks to months.

02

Repeated dosing

Mimic real consumption patterns for more predictive outcomes.

03

On top of a normal diet

Evaluate products against the background of everyday nutrition.

04

Complete physiology

Reproduces gut secretions, volumes, and transit times for all gut compartments with true-to-life accuracy.

05

Compartmentalization

Captures regional differences in the microbiome (e.g., ileum, proximal colon, distal colon).

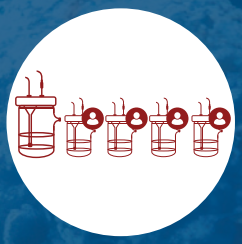
06

Proven reliability

Validated in 150+ peer-reviewed studies across nutrition, pharma, and biotech.

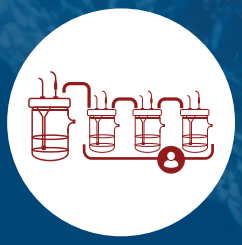
SHIME® Configurations at a Glance

One platform, four configurations — each built to deliver the right insights at the right stage



Screening SHIME®

- Best for earlier-stage research that requires higher throughput with repeated dosing.
- High-throughput, cost-effective parallel runs to quickly compare products or donors under lifelike gut conditions.



SHIME®

- Best for comprehensive gut modeling.
- Full GI tract simulation with compartimentalised insights for region-specific effects and confident product validation.

Dysbiotic SHIME®

- Best for diseased & dysbiotic microbiome research.
- Maintains IBD, IBS, diabetes, obesity and other dysbiotic states for targeted therapeutic or nutritional testing.

Long-Term SHIME®

- Best for extended treatment & recovery monitoring.
- Tracks microbiome adaptation, resilience, and recovery over weeks or multi-phase treatments (e.g. post-antibiotics).

M-SHIME®

Best for luminal + mucosal insights

An add-on for every SHIME® configuration
Inclusion of a mucus layer reveals mechanism of action for both the luminal and mucosal microbiome leading to deeper understanding

Where **SHIME®** Works for You

Typical products that can be tested in the SHIME

- Probiotics, Prebiotics, Postbiotics & Synbiotics
- Ingredients & Food Additives
- Nutraceuticals & Botanicals
- Whole food products
- Pharmaceuticals, LBPs, FMTs & antibiotics

Key Insights

- Assess overall impact on gut health
- Uncover efficacy and mechanisms of action in healthy and dysbiotic microbiomes
- Screen and compare candidates to identify top performers early
- Derisk your research and product development at an early stage
- Validate final product formulations to de-risk clinical trials
- Evaluate colonization, activity, and functional benefits
- Gain insights into interindividual variability
- Track effects across time and gut regions
- Replace animal studies by supporting cruelty-free research

From **Applications to Answers**

Every SHIME® study delivers more than just observations — it produces a detailed dataset that shows not only *if* your product works, but *how* and *why*. Depending on your research goals, SHIME® can generate insights such as:

"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."

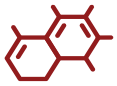
Brendan J. Kesler
R&D Innovation Director, Futureceuticals

Microbial fermentation Activity

- Measure changes in key metabolites and functional parameters of the microbiome
- Short-chain fatty acids (SCFA), lactate, branched SCFA, ammonium, and pH fluctuations

Microbial Composition & Metagenomics

- Measure changes in microbiome composition across luminal and mucosal fractions
- Profile the microbiome using shotgun sequencing, 16S rRNA, targeted qPCR, and flow cytometry



Metabolomics

- Gain insight into microbiome metabolites, pathway activity, and their impact on gut and systemic health
- A broad set of gut microbiome-related metabolites linked to metabolic health, cardiac health, inflammation, immunity, bile salt metabolism, gut-brain axis, disease phenotypes
- API stability and conversion in different compartments
- Metabolic fingerprinting approaches

Microbiome-host interactions

Evaluate how microbial changes impact host biology:

- Barrier integrity
- Inflammation and immune modulation
- Wound healing assays
- Pathogen adhesion/invasion

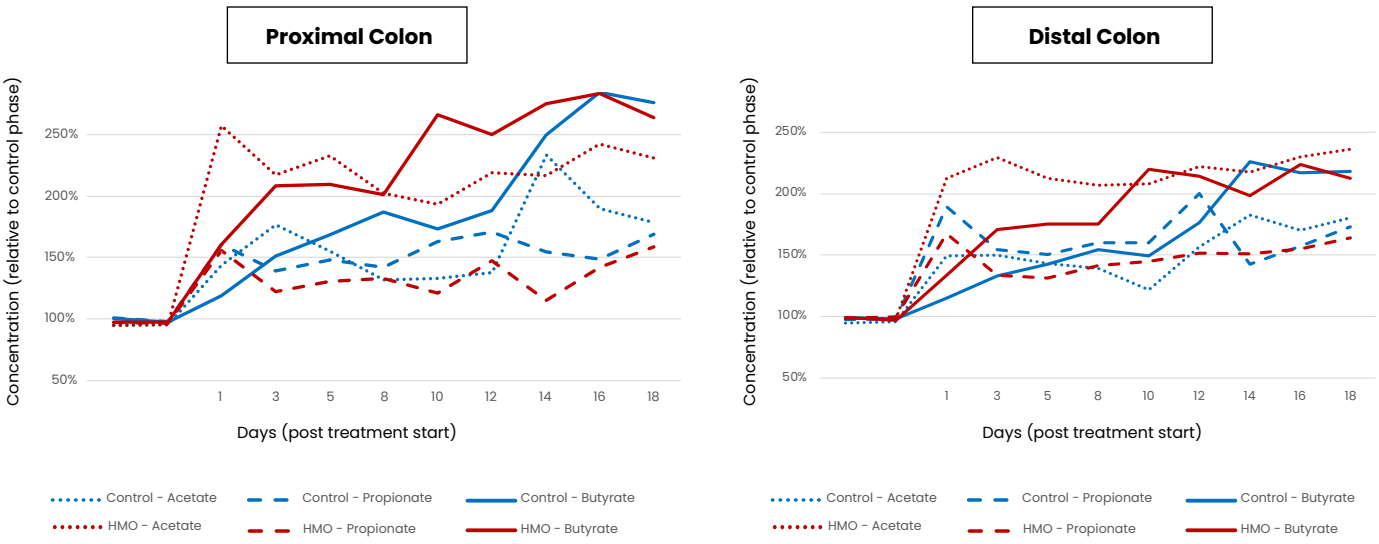
Use Case:
HMOs in Infant Nutrition

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.

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:

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