Machine learning for FMCG and foods

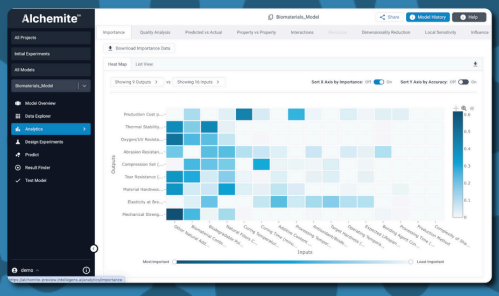
Accelerate formulation innovation

> "We could quickly drop a number of the ingredients, **speeding up development**
>
> **Yili** optimised development of dairy product formulations

Design formulated products, gaining deep insight into what controls properties

Optimise ingredients and processes, responding to market and regulatory requirements

Focus experiment, achieving better results for 50-80% less time and cost



Alchemite™ analytics - studying the relative importance of properties in determining system outputs

For foods, drinks, and fast moving consumer goods, such as cosmetics and personal care products, formulation development is critical. The success of a product and its cost, safety, and sustainability all depend on getting the right combination of ingredients and processing steps.

This presents formulation teams with a complex optimisation problem in which they need to balance the impact of formulation changes on varied outputs such as taste, texture, rheology, stability, appearance, and the costs and energy usage associated with raw materials and processing. Getting this right usually relies on costly, time-consuming experimental programs. Data often has gaps or is noisy, making it hard to analyse with conventional machine learning methods.

Alchemite™ Suite is machine learning made easy. It harnesses the power of the Alchemite™ algorithm, which can handle difficult experimental and process data, through a series of task-focused apps. You can:

- Investigate new chemistries and formulations, finding improved solutions while **cutting time-to-market**
- Efficiently design experiments, focusing on the most productive routes and **reducing workloads by 50-80%** compared to conventional DOE methods
- Extract maximum value from data, identifying hidden relationships and generating **breakthrough insights**.

Find our more: Read our white paper, *Seven examples of how materials and chemicals companies innovate with AI.* **intellegens.com/whitepapers**

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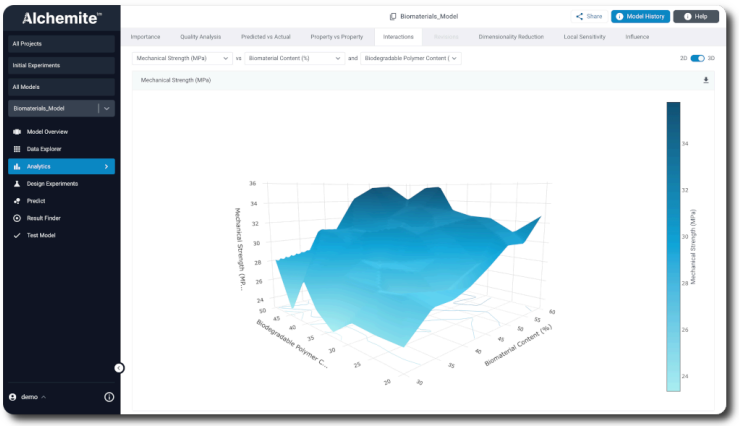

Alchemite™ provides scientists with quick, easy access to advanced machine methods and powerful graphical analytics via a series of easy-to-use apps.

Case studies

Global dairy products leader, Yili studied UHT cream formulations. "We quickly could drop out a number of the ingredients we had been testing. This wasn't obvious if you looked at them one-by-one, because you always have cross-interactions. This big learning speeded up development." intellegens.com/yili

Flavours and fragrances producer, IFF understood the sensory properties of compounds by analysing physicochemical and sensory data. "Its reliable uncertainty estimates gave us confidence to make critical project decisions". *J Comp-Aided Molecular Design* **35**, 1125-1140 (2021)

Adaptive design of experiments – Alchemite™ is used within experimental programs to suggest which set of experiments to do next in order to most efficiently explore parameter space. This *adaptive* DOE has been shown to reduce experimental workloads by 50-80%. White paper at intellegens.com/doepaper

Alchemite™ Suite

Alchemite™ offers a suite of easy-to-use apps, each focused on a key R&D challenge. Give the right app to the right team member, speeding and informing their work. Then share results and collaborate across your team, creating an integrated machine learning solution for materials R&D.

Alchemite™ Viewer	Share and view results, enabling collaboration and decision-making.
Alchemite™ Explorer	Quickly generate models, test hypotheses, explore key relationships.
Alchemite™ Designer	Set up and run Design of Experiments projects in a few button clicks.
Alchemite™ Innovator	The complete ML toolkit to support materials design and development.
Alchemite™ Architect	API access to integrate and automate powerful ML.

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