

Animal nutrition: Adisseo and TWB confirm the success of the biological alternative for producing methionine

Adisseo, the industrial group specialized in animal nutrition, and TWB, industrial biology research and development project facilitator, have been partnering since 2012 to find a biological pathway for producing methionine, an essential amino acid for animal nutrition, traditionally produced through petrochemical means. This collaborative research project, known as SYNTHACS, has recorded conclusive initial results. Building on this success, Adisseo and TWB in close cooperation with the teams from the LISBP¹ have announced the continuation of the project which has also gained support from ADEME.

Biological-pathway-produced methionine: a significant scientific discovery

This project, supported under the French “Programme d'Investissement d'Avenir” (1st call for tender - Investment for the Future), proposes an alternative to using petrochemicals for producing methionine through renewable biomass and more specifically through cornstarch. The challenge is high because unlike other amino acids manufactured on an industrial scale through biological pathways, methionine production is currently only economically-viable when done through petrochemical means.

Spurred on by researchers from the LISBP, Adisseo's R&D teams have been working for several years now on producing methionine through a biological pathway. The first research phase of the SYNTHACS project, combining metabolic engineering, enzymology and modelling approaches, has now successfully led to confirming the effectiveness of the biological pathway for producing methionine.

"This project demonstrates the potentials of synthetic biology using a pragmatic industrial approach: based on the production of a few mg of a precursor of methionine at the start of the project, we managed to multiply this more than a thousand-fold by the end", states Jean-Marie François, Professor at INSA Toulouse and the project's lead scientist. Before adding: "Thanks to TWB, we were able to take full advantage of a leading-edge technological environment, as well as administrative and logistics support which was highly-valuable for the researchers!"

Furthermore, in terms of promotion, project partners are delighted as researchers have published two articles in prestigious journals² and Adisseo has filed 3 families of patents on the global marketplace.

From scientific discovery to the industrialization phase

Drawing on this initial scientific discovery, Adisseo has decided to pursue research and to continue investing on the industrialization of this innovative procedure to develop an industrial pilot by 2020. ADEME has also agreed to co-finance this project which prefigures a viable petrochemical alternative, i.e. to produce methionine from renewable carbon sources. Ultimately, this project will also provide the opportunity to synthesize other by-products for the animal nutrition, pharmaceutical and chemical sectors.

The aim is now to go further and to attain the industrialization phase milestone. The new mission for the research teams leading the project is to produce this molecule on an industrial scale. ADEME's financial support for this new phase of development will enable Adisseo to pursue collaboration with TWB (dedicated Human resources, state-of-the art equipment made available) and as well as to hire researchers engaged on the project now known as ECOMET-Bio.

"We are delighted to pursue this project which is a wonderful example of successful public/private collaboration. This success wouldn't have been possible without the LISBP's team of researchers, led by Professor Jean-Marie François or without the expertise and support of TWB, which establishes the link between our researchers and the public research teams and, as such, ensures we are more efficient", emphasizes **Robert Huet, Adisseo Process R&D and Technology Director**.

1. Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés – Mixed research unit INSA/INRA/CNRS (Toulouse, France)
2. Publications: Nature Communication, Jun 27, 8, 15828 / Metabolic Engineering, 237-245 DOI/10.1016/j.ymben.2017.12.005

About Adisseo:

Adisseo is a world leader in nutritional solutions and additives for animal feed. The Group draws on its 11 research centres and its production sites located in Europe and in China to create produce and commercialize nutritional solutions for sustainable animal feed. It employs over 2,100 people and, thanks to its worldwide distribution network, serves over 3,500 customers in more than 100 countries.

Adisseo is one of the key subsidiaries of China National BLUESTAR, leading player in the Chinese chemical industry with some 23,000 employees and revenue of 6.4 billion euros. Adisseo is listed on the Shanghai stock exchange.

Website Corporate Adisseo: www.adisseo.com

Adisseo proposes 4 forms of an essential amino acid to its customers: methionine (Rhodimet® AT88 and Rhodimet® NP99) for poultry and pigs and protected methionine (Smartamine® M and MetaSmart®) for ruminants, sodium sulfate (Adisodium™), a full range of vitamins (Microvit®), enzymes (Rovabio®), antioxidants (Selisseo®) and probiotics (Alterion®). Adisseo provides business development support for its customers through a range of value-creating services, such as PNE - Precise Nutrition Evaluation - E-lab and DiM.

For more information on Adisseo's products and services: <http://feedsolutions.adisseo.com>

About TWB:

Expert in steering scientific projects, TWB contributes to the development of new sustainable production pathways by providing innovating and economically-efficient alternative biological solutions. To accelerate rolling out this transition towards eco-responsible industry, TWB draws on collective intelligence by creating unprecedented links between researchers, industrial groups and investors. By privileging useful, pragmatic and innovative research, TWB meets a two-fold challenge: to effectively address the climate change issue whilst creating economic value.

Since it was created 5 years ago, under the triple umbrella of the French INRA, INSA and CNRS, and with the support of its 46 partners at 1st January 2018 (industrial groups, startups, investors, research bodies, local and regional authorities, etc.), TWB has played a role in the launch of some 105 collaborative research and development projects and to the growth of a myriad of startups which have leveraged a total of over €90 M.

More information: <https://www.toulouse-white-biotechnology.com/en/>

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