SmartLine™

30+ years of **expertise**

30+ years of **research**

100+ **sponsored trials**

150+ **trials testing our products**
(sponsored or non-sponsored)

LIFETIME PERFORMANCE

SMARTLINE™ BIBLIOGRAPHY

ADISSEO
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LIFETIME PERFORMANCE

Introduction

SMARTLINE BIBLIOGRAPHY

Over the last three decades, Adisseo has established itself as the leader in protected methionine products for the ruminant market. This success results from the exceptional quality of its products and its extensive knowledge of amino acid nutrition. This knowledge was gained during years of research with universities and partners across the globe. Smartamine® M, launched in 1993, was the culmination of 10 years of research. MetaSmart®, introduced in 2005, remains the only methionine product that can be pelleted.

This bibliography contains 92 scientific publications not counting the more than 120 abstracts presented at scientific meetings. This work spans more than three decades of research by the Adisseo SmartLine™ team with the goal of better comprehending the role of amino acid (AA) nutrition, particularly the role of the essential and functional nutrient methionine.

In the production section of this bibliography, we acknowledge the significant milestones achieved in advancing amino acid nutrition, specifically the groundbreaking work by Chuck Schwab, Professor Emeritus, University of New Hampshire, on the principles of the individual amino acids that limit dairy cow performance. It has taken the dairy industry half a century to adopt the concept of amino acid balancing for the benefit of dairy producers. It was

not until 1993 that the first practical AA formulation system was published in France by Rulquin et al. This approach assigns each feed ingredient a value for metabolizable lysine and methionine. These values are based on various characteristics of the ingredient's fermentable organic matter as a predictor of a microbial protein supply, protein degradability, intestinal digestibility, and methionine and lysine content.

A pragmatic approach was employed to determine the optimum concentration of methionine and lysine in metabolizable protein using the indirect dose-response technique. The National Research Council's 2001 publication "Nutrient Requirements of Dairy Cattle" (NRC 2001) later adopted this approach with the significant evolution of bypass protein, which was no longer a fixed value by ingredient but rather dependent on passage rate and dry matter intake. Over the last two decades, the Cornell Net Carbohydrate System (CNCPS) has developed its own unique approach to determining amino acid supplies and requirements. The question of the contribution of metabolizable amino acids from feed and commercial products was also brought to light. It led to the development of in vitro and in vivo techniques to quantify the amount of amino acids absorbed by cows. Publications on this topic can be found in the bioavailability section.

An essential milestone in the history of amino acids, particularly methionine, was the realization that methionine is not only a building block for milk protein and an essential nutrient that influences many metabolic pathways in the body, but it is also a functional amino acid. When the concentration of methionine in pre-fresh rations is enhanced, the dairy animal is prepared for the onset of lactation, improving her antioxidant status, inflammation response, immune function, and ability to overcome metabolic challenges immediately postpartum. As an important functional amino acid, methionine also significantly impacts reproductive performance. Exploring the reproduction publication section will help you understand how methionine decreases pregnancy losses, increases pregnancy rates and longevity of cows within the herd.

Adisseo plans to continue investing in research to bring reliable knowledge to its clients, knowledge that will enhance dairy farm profitability. We aim to explore new research areas including beef, fetal programming, small ruminants, calves, and sustainability.

Thank you for continuously challenging Adisseo to provide proof-of-concept research that impacts dairy farm profitability. We hope this document will prove useful to you.

Amino acid balancing and dietary fortification with methionine are key to optimizing dairy cow lifetime performance.

Adisseo SmartLine Team

SmartLine™

Top Review Articles

Review articles are organized by year of publication. This shows the evolution of the science.

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Chapters in published books are to be obtained by readers. Links to the publisher are provided when available.

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