

**Innovative and practical management approaches to reduce nitrogen excretion by ruminants: REDNEX**

*Van Vuuren, A.<sup>1</sup> and Thomas, C.<sup>2</sup>, <sup>1</sup>ASG Animal Production, Wageningen UR, P.O. Box 65, 8200 AB Lelystad, Netherlands, <sup>2</sup>EAAP, Via G Tomassetti, Rome, Italy; ad.vanvuuren@wur.nl*

Dairying is an important sector of EU agriculture, but intensification has been accompanied by an increase in N surplus. This has a negative impact on groundwater (pollution with nitrates), surface water (eutrophication) and on the atmosphere (de-nitrification and ammonia volatilisation). The EU seeks to stimulate measures that improve management of nutrients, waste and water as a start to move to management practices beyond 'usual good-farming practice'. The objective of REDNEX is to develop innovative and practical management approaches for dairy cows that reduce N excretion into the environment through the optimization of rumen function, an improved understanding and prediction of dietary N utilization for milk production and excretion in urine and faeces. Novel tools for monitoring these processes and predicting the consequences in terms of N losses on-farm will be developed. At the centre of the project is a detailed mathematical model of N utilization by the cow which will act to integrate results from previous work and from new research carried out in the project. This interlinked research aims to improve the supply of amino acids to be absorbed relative to the quantity and quality of amino acids and carbohydrates in feed allowing a reduction in N intake. Research to understand amino acid absorption, intermediary utilization and the processes involved in the transfer of urea N from blood to the gastro-intestinal tract will further underpin model development and indicate strategies to reduce N losses. To predict N losses on-farm and the impact on profitability, a harmonised applied model will be derived from the mechanistic model and will be supported by tools to better describe feeds and biomarkers to indicate N status. Impact of the research will be enabled by dissemination and knowledge interaction using a participatory approach to include the views of stakeholders and recognition of the need to provide support to EU neighbours.