

B Vitamins: are rumen bacteria always sufficient to the task?

Duration : 2011 – 2016

Highlights

- The Vitamin B needs of dairy cattle are not always met through the synthesis of vitamins by bacteria in the rumen.
- In these conditions, vitamin B supplements increase lactation performance and the metabolic efficiency of dairy cattle.
- The results of this project show that concentrations of B vitamins in food do not predict the amounts available to the cow and that these amounts vary widely depending on the composition of the ration.
- A database has been compiled and is ready to be used to develop a model that can be used to predict the amounts of B vitamins available to the cow depending on the nutritional management strategy.
- This model will allow producers to modify their nutritional management strategy according to the cow's needs and, if necessary, to evaluate whether or not vitamin B supplements should be used.
- Over the long term, taking this data into account using formulation software for dairy cattle should result in increased metabolic efficiency, thereby reducing production costs and environmental waste. This will lead to increased efficiency within agricultural enterprises in Quebec and reduce their environmental footprint.

Objectives

- Hypothesis: It is possible to predict the amount of B vitamins available to cows according to the chemical composition of the ration.
- Objective: To determine the dietary supply of B vitamins, synthesis in the rumen and the flow of vitamins to the duodenum in different nutritional conditions. In addition, compile the data for the future development of a predictive model for vitamin B supply in dairy cows that can be integrated into ration formulation software to maximize metabolic efficiency in dairy cattle.

Results and potential benefits

A number of studies have shown that the vitamin B needs of dairy cows are not always met. In these conditions, vitamin B supplements increase lactation performance and the metabolic efficiency of dairy cattle. However, there is very little information that allows us to predict the conditions in which vitamin B supply is negatively or positively affected. This project has demonstrated that it is possible to predict the amount of B vitamins available to cows according to nature of the diet. The project has shed light on the factors influencing the availability of B vitamins to dairy cows. In conjunction with the studies allowing us to quantify cows' needs for B vitamins, this data will help us to identify the conditions in which dietary supplements may be necessary to meet the animal's needs.

The information collected and the database that was compiled as part of this project, once integrated into a predication model, will allow us to specify the vitamin(s) to be added to the ration as well as the dose to be used. Taking this data into account using formulation software for dairy cattle should result in increased metabolic efficiency, thereby reducing production costs and environmental waste. This will lead to increased efficiency within agricultural enterprises in Quebec and reduce their environmental footprint.

Contact persons

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Professionals trained

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For further information

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- Novalait

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