

# Strategies to reduce nitrogen excretion in fattening veal calves during the finishing phase

## Summary

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This project evaluated strategies to reduce nitrogen excretion by reducing crude protein of the diet in intensively raised beef cattle without impairing animal growth and feed efficiency and in consequence reducing environmental contamination. To achieve this objective, different studies have been conducted in a first phase to evaluate the nitrogen excretion and in a second phase to validate its effect on animal growth under field conditions. The results of the present study indicate that during the finishing phase by reducing 1% de crude protein level nitrogen excretion to the environment is reduced by 10% without affecting animal growth.

## Objectives

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The general objective was to evaluate the reduction of nitrogen by reducing crude protein dietary level in beef cattle intensively raised without impairing the animal growth and feed efficiency, and in consequence reducing environmental contamination.

The project was focused in Holstein bulls fed high-concentrate diets and in the finishing phase.

Three different nutritional strategies were studied based in improving ruminal nitrogen efficiency use and the effect on following parameters were evaluated:

- nitrogen excretion in faeces and urine
- rumen health and fermentation
- animal intake, growth and carcass quality

## Description of project activities

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In a first phase three nutritional strategies were evaluated under standardized conditions. Two type of studies were conducted; nitrogen balance studies with few animals testing 3-4 treatments to evaluate nitrogen excretion and animal health and field studies (2 treatments) to evaluate the impact of the nutritional strategies on growth, feed efficiency, health and carcass quality.

In a second phase the strategy with most success was evaluated under commercial conditions with less standardized conditions (different ingredients, feed presentation form, etc...). This second phase evaluated if the results of the first phase can be extrapolated to other nutritional and productive situations less standardized.

## Final results and practical recommendations

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Nitrogen environmental pollution is an international issue and this project aims reducing the contamination caused by the animal. The results of the present project indicate that that during the finishing phase by reducing 1% de crude protein level nitrogen excretion to the environment is reduced by 10% without affecting animal growth.

Moreover, the production costs can be also reduced (feed formulas are cheaper) and the benefits can increase 7.3€/animal fattened t (179.8€ -172.4€); this can decrease production cost by 1.5%.

Finally, this project can help to improve the consumer's perception of the beef sector and help to enhance the meat consumption. Implementing these strategies that reduce environmental pollution can help to explain to consumers that beef producers are worried about the impact of their activity on the

environment, helping to clean the damaged image that they have and increasing meat sales.

## Conclusions

As mentioned previously the reduction of the CP level of the concentrate during the finishing phase reduces the nitrogen environmental pollution; reducing 1% of crude protein level nitrogen excretion to the environment is reduced by 10% without affecting animal growth.

## Operational Group Leader

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## Keyword-category

Animal husbandry and welfare

Fertilisation and nutrients management

## Territorial scope

**Province**

Lleida

Girona

**County**

Urgell

Segrià

Barcelona

Segarra  
Pla d'Urgell  
Noguera  
Garrigues  
Bages  
Alt Empordà

### Project dissemination *(publications, seminars, multimedia...)*

(publicacions, jornades, multimedia) XVIII Jornada del Boví Alcarras, paper i presentació a ITEA i ASAS ene I 2017. El 2018 es preveu fer una jornada de difusió dels resultats

### Pàgina web del projecte

### Other project information

#### Projecte period

#### Approved budget

Starting date (month-year): Novembre 2015

**Total Budget: 269.291,79 €**

End date (month-year): Setembre 2017

*Funding source DARP:* 110.770,54 €

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*Funding source UE:* 83.563,74 €

*Own funds:* 74.957,51 €

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*Basic regulation: Ordre ARP/258/2015, de 17 d'agost, per la qual s'aproven les bases reguladores dels ajuts a la cooperació per a la innovació a través del foment de la creació de grups operatius de l'Associació Europea per a la Innovació en matèria de productivitat i sostenibilitat agrícoles i la realització de projectes pilot innovadors per part d'aquests grups, i es convoquen els corresponents a 2015.*

*Id. projecte: 50 2015*