



Environmental assessment of precision feeding used in a broiler production system (Task 6.2.)

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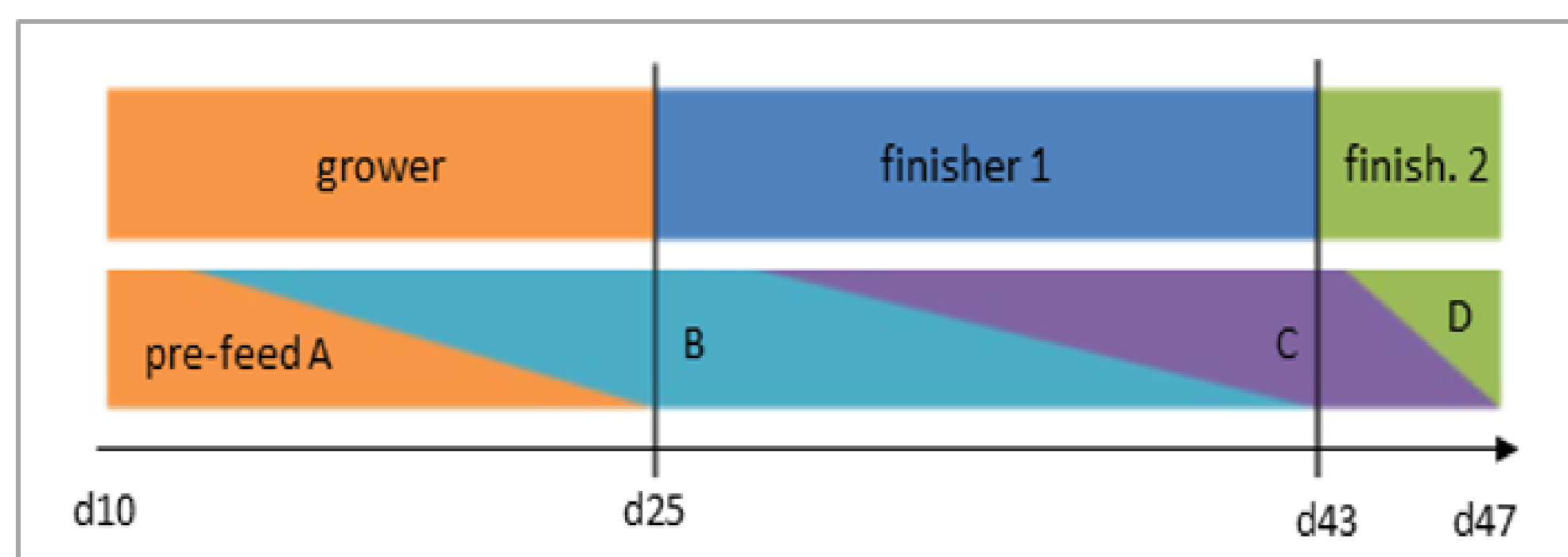
Objectives

Feed production, as well as nutrient excretion, both represent a major proportion of most environmental impacts of broiler production systems. One way of reducing these impacts is to optimize the feeding program in order to respond as closely as possible to the animal dietary needs. Thanks to precision feeding (PF), less dietary protein is required and nitrogen excretion to the environment is reduced. An objective of task 6.2 was to assess (by a Life Cycle Assessment or LCA) the environmental impacts of a broiler system using precision feeding, compared to a baseline.

Precision feeding system

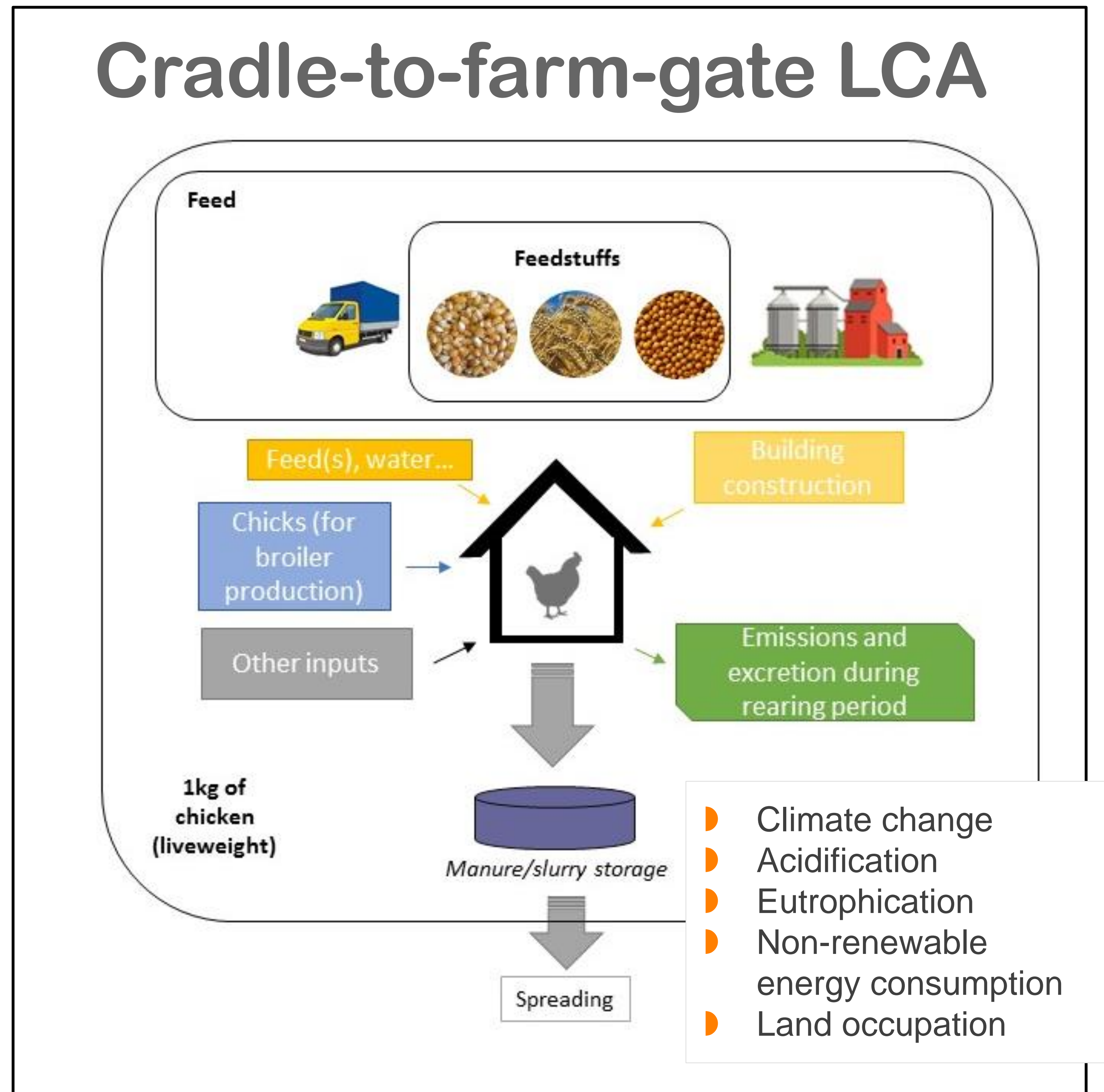
Precision feeding consists of feeding a **blend of pre-diets mixed each day in variable proportions** to provide a complete ration that best meets the daily requirements of the animal. A trial was conducted in WP4 and results were used to form hypotheses regarding the use of precision feeding in commercial systems.

For the LCA analysis, a solver was used to simultaneously optimize the composition and the daily incorporation rates of the pre-diets while minimizing costs (bilinear optimization).



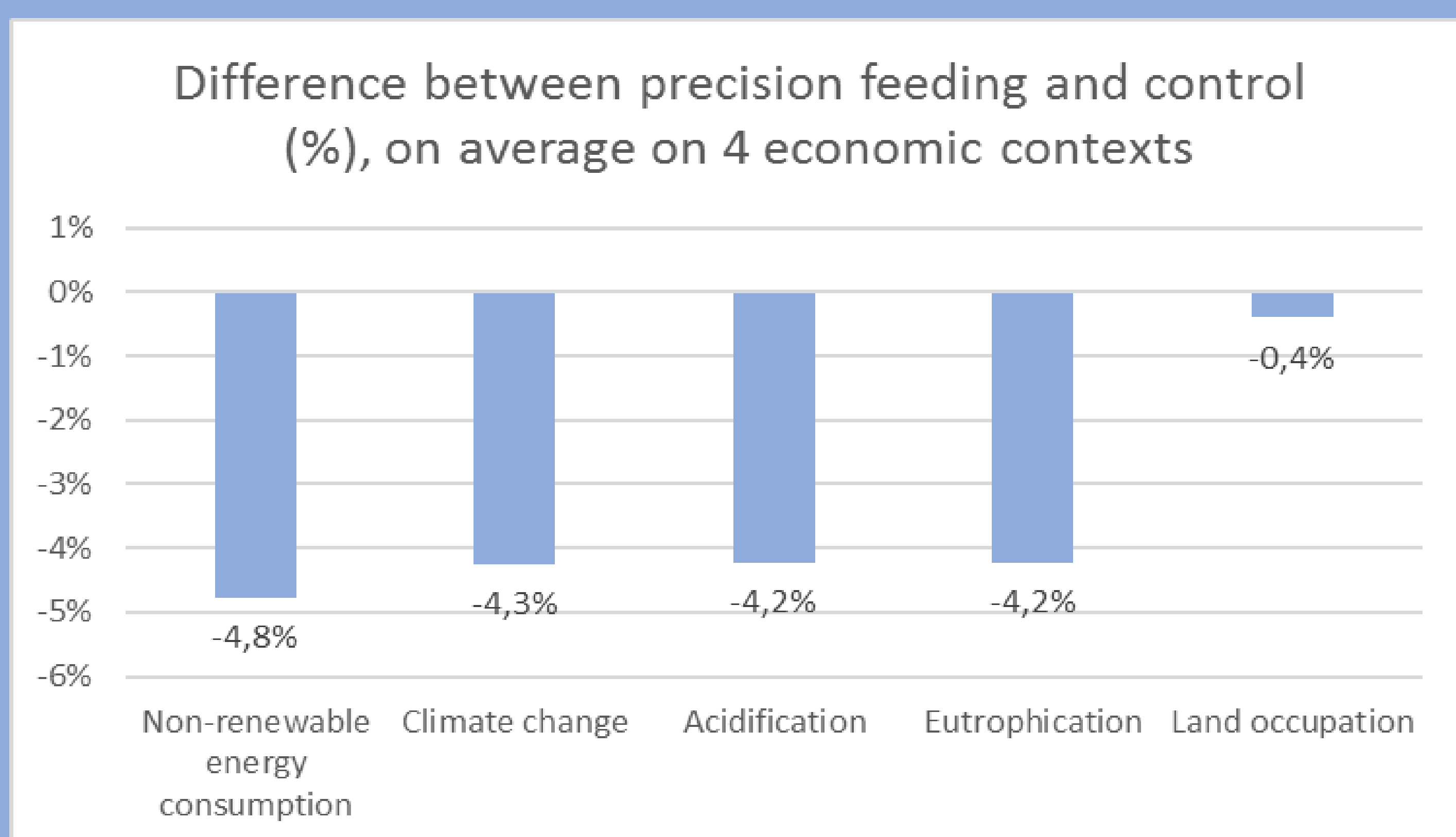
← Multiphase feeding strategy VS precision feeding strategy (adapted from Dusart et al., 2019) – Strategies from WP4 broiler trial

Cradle-to-farm-gate LCA



The baseline and precision feeding simulated systems had the following characteristics: building (1300m²) with litter floor, slaughtering at day 32, at 1.86 kg, with performances based on the trial.

Results



- reduction of all the impacts considered, due to a **reduction of the total nitrogen content** in the diet = better matching of the requirements of the broilers and the composition of their diet
- Total feed intake was considered to be the same between the control system and the precision feeding system
- Max difference is only -4.77%, meaning precision feeding could be a leverage but does not significantly, in the systems considered, reduce the impacts

- When considering the composition of the average control VS precision feeding feeds (average over 4 economical contexts, and weighted average over starter-grower-etc or pre-feed A, B, C etc), there is **no obvious difference in composition**. However the **global protein content of the average feed is decreased by 4.7%** in the precision feeding system.

Contact

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