INVITATION
PUBLIC DEFENSE

INNOVATING ANTIMICROBIAL STEWARDSCHIP ON DAIRY FARMS THROUGH ON-PRACTICE CULTURE

Creytens Lien
March 31, 2026

PROMOTERS

Prof. dr. S. De Vliegher
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Curriculum Vitae

Lien Creytens was born February 11, 1992, in Eeklo, Belgium. As the daughter of a dairy farmer, her interest in veterinary medicine developed from an early age. After completing her secondary education in Latin-Mathematics, enrolling in the Veterinary Medicine program at Ghent University was an evident choice. In 2017, she graduated as a veterinarian with a focus on ruminants, after which she gained four years of practical experience in the cattle, small animal practice, and white veal calve sectors. In October 2021, she returned to the Faculty of Veterinary Medicine at Ghent University to start a PhD within the M-team. This research was funded by VLAIO.

Lien Creytens is the author or co-author of several scientific publications. She has been a speaker at and actively participated in multiple national and international conferences and meetings.

Where?

The defense will take place on
Tuesday March 31, 2026 at 17h

Auditorium A
Faculty of Veterinary Medicine
Ghent University, Campus Merelbeke
Salisburylaan 133, Merelbeke

A reception will be held after the defense

Registration

If you would like to attend the reception or attend the defense online, please register before 18th March 2026 by email to Lien.Creytens@UGent.be

Members of the Examination Committee

Prof. dr. G. Opsomer
Chair of the Examination Committee

Prof. dr. D. Maes
Faculty of Veterinary Medicine, UGent

Dr. H. Van Loo
Faculty of Veterinary Medicine, UGent

Prof. dr. H. Barkema
Faculty of Veterinary Medicine and Cumming School of Medicine, University of Calgary, Canada

Dr. Z. Lipkens
Milk Control Center Flanders, Lier

Dr. T. Vanholder
Digiredo, The Netherlands

Summary

Antimicrobial resistance, linked to antimicrobial use, represents a major challenge in both human and veterinary medicine. In dairy farming, most antimicrobials are used for the treatment and prevention of mastitis. Therefore, optimized udder health management is essential to safeguard animal welfare and milk quality, while simultaneously omitting unnecessary antimicrobial use. In addition, the recent European Regulation 2019/6 has accelerated the shift towards a more preventive and diagnostics-driven approach. Selective strategies, such as selective dry cow therapy and selective treatment of non-severe clinical mastitis, are important tools in this context.

The aim of this thesis was to investigate the interaction between antimicrobial use, antimicrobial resistance, and udder health management in Flanders, and to implement selective treatment of non-severe clinical mastitis using an on-practice culturing approach (i.e. the use of rapid tests at the veterinary practice) in the Flemish dairy sector.

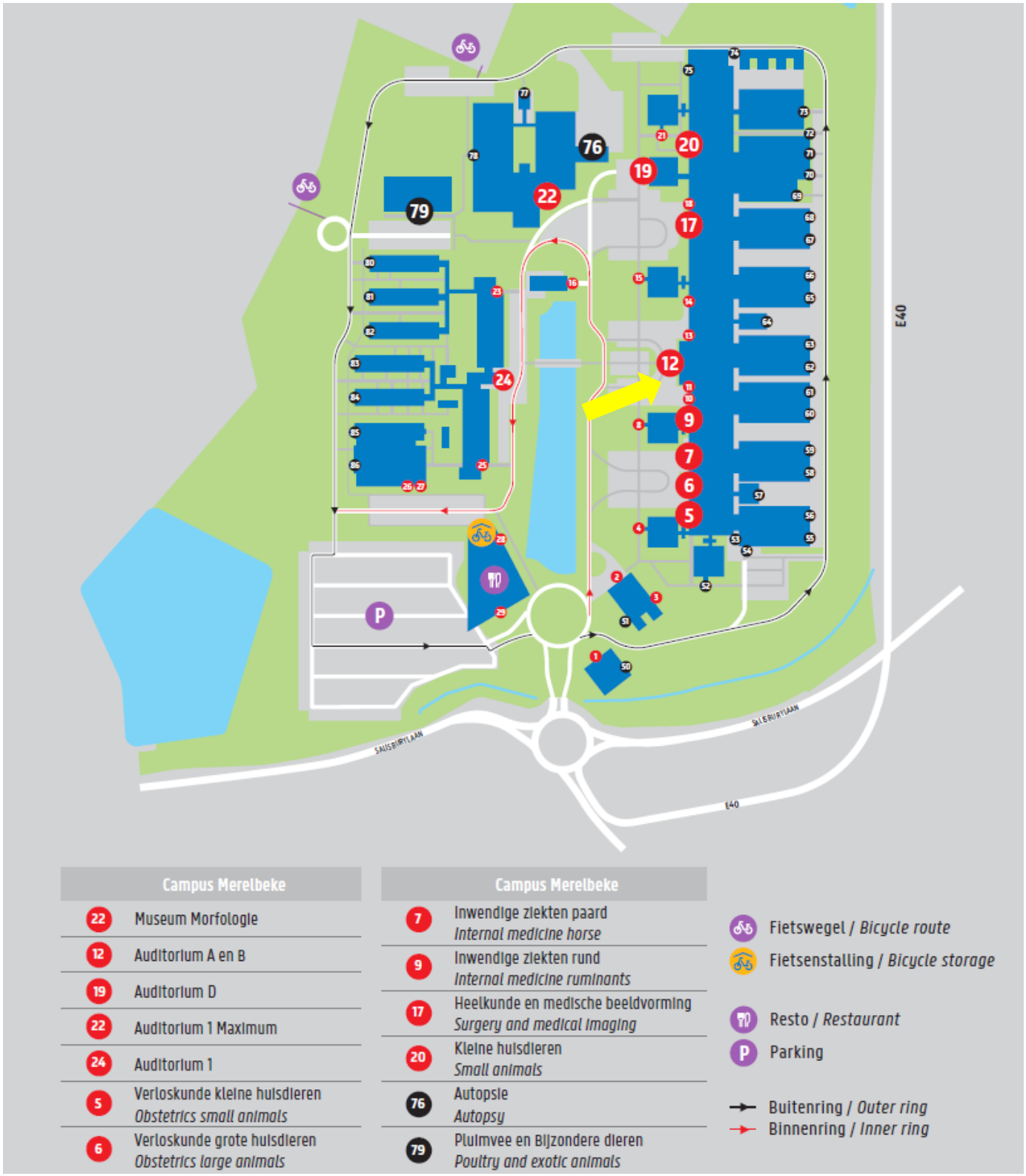
First, a systematic review and meta-analysis confirmed that selective treatment of non-severe clinical mastitis based on on-farm culturing (i.e. the use of rapid tests on the dairy farm), compared with immediate antimicrobial treatment, has no negative impact on bacteriological or clinical cure, somatic cell count, milk production, or recurrence risk. These findings support the safe implementation of selective treatment using an on-farm culturing approach.

Next, questionnaires provided insight into the knowledge, attitudes, and opinions of Flemish dairy farmers and veterinarians regarding udder health management, bacteriological culturing of milk, responsible antimicrobial use, and evolving antimicrobial legislation. Among Flemish dairy farmers, important knowledge gaps regarding basic udder health were identified. Furthermore, a positive attitude towards the importance of udder health did not always translate into best practices, and veterinary involvement was identified as a key factor in optimizing udder health management. Among veterinarians, there was also room for improvement, particularly regarding the frequency of veterinary udder health monitoring services. Younger and more recently graduated veterinarians showed greater awareness of antimicrobial use, antimicrobial resistance, and the importance of bacteriological culturing of milk compared with their more experienced counterparts. Continuing education and structural support are needed to further strengthen their role as herd health advisors.

During a two-year field trial on 34 dairy herds, the effects of selective treatment based on on-practice culturing were evaluated under Flemish conditions. This approach showed no negative impact on somatic cell count or bacteriological and clinical cure. Moreover, selective treatment resulted in a 42.8% reduction in the number of antimicrobial-treated cows and shortened the period during which milk had to be discarded. However, attention is needed for farms with suboptimal udder health management, as selective treatment in these herds was associated with decreased milk production and did not reduce antimicrobial use.

Finally, the use of two rapid tests for pathogen detection in milk was evaluated. Both tests proved reliable for use in the context of selective treatment, although caution is warranted when using them for broader management decisions based on detailed pathogen identification.

Overall, this PhD demonstrates that selective treatment is a valuable strategy to reduce antimicrobial use without negative effects on animal health or production, provided it is implemented within a framework of good udder health management, adequate diagnostics, and strong veterinary guidance. Further education, behavioral change, and close collaboration between veterinarians and dairy farmers are essential to achieve sustainable antibiotic stewardship in the dairy sector.



Auditorium A: entrance 12 (yellow arrow), 1st floor