Rapeseed-enriched diet and low-level thiouracil administration in cattle: impact on thyroid hormone metabolism
Jella Wauters¹, Julie AL Kiebooms¹, Julie Vanden Bussche¹, Eric Fichant², Philippe Delahaut², Lieven Van Meulebroek³, Lynn Vanhaecke¹

¹ Ghent University, Faculty of Veterinary Medicine, Department of Veterinary Public Health and Food Safety, Laboratory of Chemical Analysis, Merelbeke, Belgium
² CER group, Health Department, Marloie, Belgium

This project is granted by the Belgian Federal Public Service for Health, Food Chain Safety and Environment (THYREOMERK; RF/6260)
Contact: Lynn.Vanhaecke@ugent.be; Jella.Wauters@ugent.be; Website: www.vw.ugent.be

Introduction
Thyroid hormones are considered to have a crucial impact on differentiation, growth and metabolism in all vertebrates. This precious balance is easily disturbed by high levels of thyrostatics, such as thiouracil, which may be abused as growth promoting substances in live stock, but are currently also identified as endogenous compounds through Brassicaceae-enriched feed supplementation. With this study, we aimed to elucidate whether low-level synthetic or endogenous thiouracil may influence one of the most interwoven hormonal pathways and hereby consequently exert a deleterious effect on animal health.

Material and methods
• 2 experimental groups:
  ➢ synthetic thiouracil (TU) administration @ 0.2 g/100 kg per os
  ➢ Rapeseed-enriched diet (30%) (RS)

• Applied techniques:
  ➢ Total thyroid hormone analysis (serum)
  ✓ Triiodothyronine (T₃)
  ✓ Reverse-T₃ (rT₃)
  ✓ Thyroxine (T₄)
(Kiebooms et al., 2014)

Results

Discussion and conclusions
An obvious effect of both low-level synthetic TU administration and endogenous TU formation was demonstrated in both calves and cows, but with opposite effects. An upwards shift of baseline levels was observed for T₃ and T₄ as a consequence of both treatments in calves. Synthetic TU administration was clearly responsible for decreasing T₃ and increasing rT₃ serum values in cows, while the effect of the rapeseed diet was limited to increasing rT₃ levels.